The Builder.

No. CLXXIV.

SATURDAY, JUNE 6, 1846.

IT was thought that the serious differences between the master builders and their operatives, in Liverpool, Manchester, Birmingham, Leeds, and other important places, unusually protracted and important as they have been, were at length satisfactorily arranged, and that work would be immediately resumed. A conference, between a deputation of the masters and a deputation of the workmen, was held last week before Mr. Rushton, the magistrate, in Liverpool. The masters urged, that labour should be free, and that no man should be compelled, against his will, to join a club, and forbidden from accepting for his time, any but a stated sum. They then submitted, as a proposition:—

"That a disclaimer be made of the right of any man or body of men, interfering with the freedom of labour, and they admitted the perfect right of all artisans to work for whom and upon what terms they pleased."

After some discussion this was agreed to. The next proposition was:—

"That the various trades connected with building, repudiate all connection with a general and national trades union, the masters offering no opposition to local association for the general benefit of the working classes; and the workmen agreed to offer no molestation or annoyance whatever to those men who are now at work, and who have signed the declaration."

The different members of the trades deputation denied that there was any thing like a national union existing, amongst the various trades. On the part of the masons, it was admitted that of this body a general union existed throughout the country.

Mr. Holme said he felt perfectly satisfied that there was a national union existing, and the result of that union was, that it was utterly impossible, with any degree of safety, for masters to enter into contracts for work, under the dictation of an organization of trades, which had its ramifications throughout the country.

An assurance having been given by the men, that their respective trades did not belong to any national or general association, the proposition was withdrawn.

It was then agreed to on the part of the operatives, "that no molestation be offered to those workmen who are now employed, and have signed the declaration" (in number, nearly 1,000), "and that the deputation of workmen here present, agree most earnestly to impress upon the minds of their fellow-workmen, the propriety of abstaining from the use of any terms of reproach to those men who have already agreed to the masters' terms, and who are now employed."

The masters then proposed that, as some of the branches of the building trade commenced work at 6 o'clock on the Monday morning, and left off at half-past 3 o'clock on a Saturday afternoon, while others commenced at 7 o'clock on Monday morning, and worked until 4 o'clock on the Saturday, a practice which had been found most inconvenient, an uniformity of commencing and leaving off should be obtained, and that the whole of the trades should commence at 6 o'clock on the Monday, and leave off at 4 on the Saturday, which would be more convenient to all parties. To this the masons strongly objected; and, after a discussion, it was agreed that the hours of labour should remain the same as heretofore; but that the distribution of the time should be arranged between the various trades and their employers, and should form no part of the present negotiation.

The foregoing conditions having been agreed to, the masters agreed to waive calling on the men to sign the "declaration," previously alluded to, and the conference ended.

It will be seen, however, that although something had been achieved (the declaration being the main grievance on the part of the men), the first cause of the strike, namely, amount of wages, was left untouched; and the masons, before they would come to work, demanded an increase of one shilling per week to their wages, and half an hour for refreshment, at four o'clock every afternoon. Mr. Tomkinson, the builder, to whom the demand was made, at once refused to accede. The masons therefore, still remain out, and the other trades follow their example.

A meeting was afterwards held, when the last-named gentleman was in the chair; and after stating what had transpired, said, he left it to the meeting to come to some resolution on the painful subject, rendered doubly so to him because he had left the meeting held before Mr. Rushton, on Wednesday, with a firm impression—that impression being the same on Mr. Rushton's mind, and on the minds of the masters generally—that the affair had been amicably arranged. He was aware that keeping the question open was the cause of the deepest injury, which he was sure must be deplored by every gentleman in that room. The fault, however, lay with the masons themselves, who were acting in a way to prevent any amicable arrangement being made with the other trades, who were willing to abide by the agreement entered into; and he himself had almost arrived at the conclusion, that any concession made in the kindest spirit would only lead to further demands.

After a long conversation, the following resolution was unanimously agreed to:—

"Having read the report of the meeting which took place yesterday before Mr. Rushton, between the deputation of the master builders and the deputation of the workmen, and also hearing the statement of the chairman as to the conference to-day, between himself and a deputation of the operative masons, when a demand was made for half an hour's cessation from labour each afternoon: Resolved,—That the number of hours of labour be the same as before the strike, but that it be competent to any member to make such a distribution, and such hours as may be considered convenient to the respective trades."

It does not seem likely that the men will remain out much longer; indeed before this, something definite has probably been effected, the differences being very considerably narrowed. The masons reckon on the number of large works at present going on, and for the completion of which, by a certain time, the contractors are bound under heavy penalties. They miscalculate on public opinion, which is certainly with the masters, and act in ignorance of the laws which regulate wages. In reply to the secretary of the masons' union, who said they were very strong, Mr. Samuel Holme, justly replied, that union might give strength for a time; but union could not give employment or create work, but the reverse; and that if, by the strength of the masons' union, they imposed terms which the public refused to pay, a diminution of their work would be the consequence, and they themselves would eventually be the sufferers.

The question, indeed, is now between the public and the workmen; if the masters are compelled to pay higher wages, the charges to their employers must be higher also; and the result would be, less employment and consequent injury to all parties. Devices will be used to avoid employing masons, and capital will seek fresh channels. A writer from Liverpool says,—"One of our first architects has resolved to abandon the use of stone in building, as much as possible; and at this time we are credibly informed that several piles of building are proceeding where iron has been substituted for stone. We perceive by one of our local prints, that a gentleman from Wales has waited on some of the principal builders, and offered to supply a substitute for stone in the shape of door and window heads, cornices, and other things, made out of the Welch fire clay, and which can be produced at about half the cost of stone; and we doubt not, in this age of mechanical skill, that various expedients will be devised to abolish masonry, if the masons themselves shall render the use of stone too expensive."

The mischief of the strike is not confined to builders alone, but has a serious effect on the trades connected with them. Timber, we learn, has fallen 2d. a foot; dealers in glass and lead, and brickmakers, especially complain; and of course the general stagnation seriously affects the small shop-keepers, who will, with difficulty, pay their rents—so intimately is society interwoven, and one portion of it dependent on another.

We urgently exhort the leaders in this movement, some of whom, we know, are readers of our journal, to throw no difficulties in the way of an immediate arrangement, but, on the contrary, to use their influence with their colleagues to prevent further discussion, and induce the men immediately to resume their work.

In order that our readers may have a complete view of the present position of things, we must mention that the Builders and Contractors' Association is now completely organized.

Mr. Bellhouse, of Manchester, is president, and Mr. John Tomkinson, of Liverpool, vice-president; Mr. Edwards, of Manchester, and Mr. James Holme, of Liverpool, auditors. The committee of management consists of six members for Manchester, six for Liverpool, six for Birmingham, four for Leeds, four for Preston, Sheffield, and some other large and populous places, and two for minor towns, such as Bolton, Wigan, Macclesfield, &c. The rules and laws for the government of the association will be forthwith printed for general distribution, and local committees formed for the various towns, each having a secretary; so that, on any intimation of a strike, or any unusual demands being made by the unions in any particular place, every member of the association throughout the country, will be immediately made acquainted with it, and be prepared accordingly.

We do not mention this association with any feeling of satisfaction,—quite the reverse. The antagonistic principle thus developed, the further separation of classes whose interests are, or should be identical, is greatly to be deplored, and we shall look with deep interest for the arrival of the time, when the masters' union and the men's union, shall merge in one general union for the general good.

The money which has been foolishly and wickedly wasted, in this ill-advised struggle, would have provided the means of education for thousands of their children.

LEAVES FROM AN ARCHITECT'S DIARY.
No. 2.

—The practice of committing ideas to paper, or, as it might be expressed, of thinking pen-in-hand,—this form of attentive consideration, and tabular systematizing of thoughts and reflections, would be a greater assistance than many wit of, in the accomplishment of their professional duties. For, as the grand secret of success, that which enables one man to carry on an amount of labour twice as great as another, consists in system and arrangement, so that system can be greatly promoted by the habit to which reference is made. The number of original thoughts which constantly arise and perish, for want of a ready memorandum, would, in minds of no extraordinary capacity, almost equal in importance the more patent results of investigation and labour. The lid blown off by the steam from a kettle, or the apple which fell from the tree, trifling as the incidents might have been in themselves, were really the precursors of discoveries, one of the most important element in the progress of modern science, and the other of the laws which regulate the universe.—Not that any argument can be drawn from this, that research is of little importance; inventions are valueless till certified by experiment, and habits of investigation themselves originate those ideas, which too often disappear almost as soon as they arise.

—Recurring to preceding pages of this Diary,—how many of them are records of exertions, which did not bring an adequate return? Difficulties there may be in every profession; much labour must be gone through—and that we accept willingly—and the main end of labour accomplished only sometimes. But I do not think that in any other profession there is the same indifference to its interests, which characterizes our own. The opinion of an architect, when applied for, and his time, are his property, as the world *knows* they are in the case of the barrister, and the physician—why repeat any thing so obvious? Because the world will not know this, and the architects seem careless to explain it. Not to mention the one great system of swindling by committees, in competitions, which as much deserve to be the subject of a "blue book," as many that come from the parliamentary press, the extent of which architects themselves are not aware of, and the injurious results of which people generally do not stop to estimate; the architectural profession to popular eyes is shrouded, and those who are painfully interested make no effort to dispel the mist.—An architect, what is he? Mr. Planché lately told some thousands of people that he was a *builder*;* not an able and honest one, but the perpetrator of those vile productions, built of condemned bricks and unseasoned timber, to which allusion was made some pages back.† To

"Stipulate that houses now should *stand*,"

was

"A fallacy, exploded long ago,
As ruinous to architects," * *

for, according to the same authority, if

"dwellings were to last for ages,
The half of us will not get workman's wages."

Thus a large audience go home every night, each one of them thinking, that all the shaky windows and creaking floors in *his* house are the work of "these architects,"—not one of whom ever heard of the place—and not only that, but that such mal-construction, it is the interest of the architect to encourage, and that he is rascal enough to do so. "Great is truth, and will"—but nobody says when—"prevail;" one erroneous statement boldly made, and pregnant with sarcasm, lays stronger hold of the popular palate than any truth supported by evidence, but needing the trouble of examination. As the easiest way of teaching children is by rhymes, so the jingle and the satire are recollected, whilst the injustice and the slander are uncared for.—A building is erected,—some wit discovers it is like something, no matter what; from that moment all inquiry into its actual merits is at an end. The dictum is quoted in encyclopædias and popular literature; people who never opened a book on architecture telegraph the jest, and the world assumes it to be incontrovertible. When you have set before you dishes garnished and spiced, think it not amiss to inquire a little, what *may* have been the naked state of that particular *entremet*, and though you relish the pepper, and pass by the oil, court rather the plain old English fare, which aims at no deception, and shews precisely what it is.—People *will have* showy buildings, and will have them cheap;—who answer for it? "Architects." People "*save* the expense of an architect"—who answer for it? "Architects." Men of science, who make acoustics or ventilation their entire study, fail;—who again bear the brunt? "Architects." A member of parliament the other day argued, that the system of ventilation should be persevered in for the sake of experiment. Ventilation is the architect's business, but who would dream of giving him a building and a separate amount to *experiment* with.—The clever author of the burlesque is probably, by this time, aware, that architects have had no hand, in the "streets, crescents, and squares," and that it is "the gulls" who "take" the houses who keep up the bad system of building, which architects quite agree with him in denouncing.

—Thus it appears, that the impediments to success in the profession of an architect, arise mainly from the want of familiarity in the public with the nature and value of his labours, and the proper mode of remunerating them, leading them to consider the pursuits of architect and builder as identical, to ask that from the architect, which in any other case, they would not think of accepting without the equivalent; to which it is necessary to add, the too facile acquiescence of architects themselves, in what tends alike to their own detriment, and that of every one else, in health and personal comfort, in mind, body, and purse. Architects must become true cosmopolites; let them enter into the world, and advocate the improvement of taste, and the scientific construction of buildings on the principle of public good, and they will so best advance their own immediate interests.

* Vide p. 181, *ante*.
† Vide "Leaves from an Architect's Diary," ante p. 170.

PROHIBITION OF SMOKE.

REPORT BY SIR HENRY DE LA BECHE AND DR. PLAYFAIR.

Our readers may remember that a bill for the general suppression of smoke, before the House last session, was withdrawn upon an understanding that a subject of such admitted public importance should be left in the hands of the Government, and that some measure having this for its object should be submitted to Parliament by them.

Before doing this, the Government thought it desirable to refer the matter to Sir Henry De la Beche and Dr. Lyon Playfair, directing them to inquire, amongst other things, into the means at present adopted for the prevention of smoke in various parts of the kingdom.

We take the following from the report of these gentlemen now published:—

"The general principles upon which the combustion, or rather the prevention of smoke, may be effected are now well known, and admitted to be applicable in practice. Smoke consists of vapours produced by the partial combustion or distillation of coal, carrying up small particles of the fuel in mechanical suspension, and depositing, by the combustion of one of their constituents, carbonaceous matter in a fine state of division. The mode of preventing this smoke is to admit a sufficient quantity of air to effect the combustion of the carbonaceous matter, when the vapours are of a sufficiently elevated temperature to unite entirely with the oxygen of the air. If the temperature be not sufficiently elevated, the hydrogen of the vapours alone is consumed, and the carbon is separated in the fine state of division referred to. The gases produced by the complete combustion of fuel are colourless and invisible, and therefore do not come under the definition of the term smoke.

As the prevention of smoke implies the complete combustion of fuel, the result, as an abstract statement, always is, that more heat is generated, and a saving of fuel effected, when it is so consumed as to prevent the emission of smoke; but although this theoretical conclusion is undoubtedly correct, the practical results are not always consonant with this statement.

In consuming smoke in the usual way a quantity of cold air is introduced into the fire, and as this must be heated up to the temperature of the surrounding fuel, the loss of the latter may be equal to, or even greater than, the saving of the fuel from the combustion of the products of distillation. This often results in the careless use of furnaces constructed on the principle of smoke prevention, and thus leads to the contradictory statements given by those who have used such furnaces. But in all carefully conducted experiments the saving of fuel has been considerable, and the reason of this will be at once perceived, when it is considered that in addition to the combustion of the products of distillation there is a large amount of fuel saved by the combustion of a gas called carbonic oxide, formed by the proper product of combustion, carbonic acid, taking up in its passage through the incandescent fuel, another portion of carbon, which escapes useless as regards the production of heat, unless burned by the air introduced at the bridge of the furnace, for the purpose of consuming the products of distillation.

From these considerations, and from experiments conducted under our inspection, with a view to determine this point to our satisfaction, we arrive at the conclusion, that although from careless management of fires there is often no saving, and that indeed there is frequently a loss of heat in the prevention of smoke, still that with careful management the prevention of smoke is in many cases attended with, and may in most cases be made to produce, an economy of fuel.

It may be unnecessary to remind your lordship that the cause of the emission of smoke in manufactories may be classed under three different heads, the relative importance of which involves very different considerations in any attempt to legislate for its prevention. These are,

1. The want of proper construction and adjustment between the fire-places and the boilers, and the disproportionate size of the latter to the amount of work which they are expected to perform; 2. The deficiency of draught, and improper construction of the flues leading to a chimney of inadequate height or capacity; 3. The carelessness of stoking and management by those entrusted with the charge of the fire-places and boilers."

Into some of the local acts for the suppression of smoke, provisions were introduced which have rendered them to a great extent inoperative.

"Most of the recent acts for this purpose are founded on the clause in the Derby Improvement Act, which enjoins a penalty 'for or in respect of every week during which such furnace or annoyance shall be so used or continued.' Now, as it cannot be proved that smoke does continue without cessation for a 'whole' week, seeing that, in all chimnies, there are periods when no smoke is emitted, and that smoky chimnies do not emit opaque smoke more than 20, and in the worst cases not more than 30, minutes in the hour, and that at night the small amount of fire kept on in the furnaces prevents the emission of smoke, no conviction can be obtained under this Act. Eminent legal authorities have been consulted, and have stated as their opinion, that for the purposes of conviction, it is essential to prove that a furnace continues to smoke for a whole week without interruption."

Relative to various Acts:—

"The general result of the examination is that they have proved unsuccessful,

1. From legal difficulties in procuring a conviction under the present ambiguous wording of the smoke clauses.

2. From inefficient supervision, and want of compulsory powers to make the execution of the Act imperative.

3. From want of adjustment in the amount of penalties, which in some cases are so small as to be practically useless; in others so large, and accompanied with so much expense in obtaining the conviction, as also to be inefficient.

Lord Lincoln's letter does not authorize us to make any recommendation as to legislative enactments; but it may be proper to mention that in every locality statements were made to us, that the only mode of obtaining an abatement of the nuisance was by summary convic-

tion before a magistrate, the penalty being exacted once for any part of a day during which a chimney continues to smoke. At the same time it must be observed, that when we consider the magnitude of the interests affected, the expense attending alterations, when the cause of the evil is connected with deficient boiler room or inefficiency of draught, it is necessary that there should be provision made, to ensure the parties against undue application of powers generally entrusted. Your lordship will doubtless consider whether in such instances, it would be advisable to cause the expensive process of an appeal to a higher court to be the only means of redressing such grievance, or whether the same principle might not be applied as that contained in the Health of Towns Bill, to enable the Government, on application to that effect, to institute inquiry by a properly qualified officer as to whether the convicted parties had fairly tried the ordinary means for abating the nuisance, and whether further time should not be granted for continued experiments.

It cannot for a moment be questioned, that the continued emission of smoke is an unnecessary consequence of the combustion of fuel, and that, as an abstract statement, it can be dispensed with. But your lordship will perceive that there are grave difficulties connected with a general law to the effect that it shall be unlawful for chimnies, after a certain date, to emit smoke. With regard to steam-engines, the processes for the prevention of smoke have been matured, and in very many instances successfully employed. In this case, therefore, a law to that effect could be most easily and promptly carried out. In other cases mentioned in Lord Lincoln's letter, such as distilleries, dye-works, &c., the legislature has already granted powers in the Manchester Local Act; and as there are certain instances in which processes for the prevention of smoke have with them proved successful, it may be anticipated that the nuisance arising from these sources may be much abated, if they be subjected to the general law with that forbearance and caution which, under certain cases, is so advisable. There are certain processes in glass-works, iron-furnaces, and potteries, in which it is neither possible nor desirable to apply a general law for the prevention of smoke; although the nuisance may be partially mitigated, by causing the steam-engines employed in them to be so constructed as not to emit smoke."

"It is useless to expect, in the present state of our knowledge, that any law can be practically applied to the fire-places of common houses, which, in a large town like London, contribute very materially to the pollution of the atmosphere; but it may confidently be expected, that by a wise administration of a legislative enactment, carefully framed, a great progressive diminution of the smoke of large manufacturing towns will be effected, and that the most happy results will thus flow from this improvement, in the increased health and moral feeling of their population, the intimate connection of which with facilities for cleanliness has been so often pointed out."

GREEK AND ROMAN PORTRAITS.

We alluded a short time ago to a paper on this subject, which was read at the Institute of Fine Arts, by Mr. R. N. Wornum. It displayed considerable learning as well as acumen, and shewed a development of painting at a very remote period, little contemplated by the generality of artists. We have much pleasure in laying some extracts from it before our readers.

"It is a prevailing, though not a general impression, that the ancients were better sculptors than painters. This is easily accounted for. Most persons are disposed to believe what they see, and comparatively few what they hear only, especially if their own experience is of a contrary tendency. The paintings also of Pompeii, and of the ancient vases, have incontestibly tended rather to lower the reputation of the ancient painters in the estimation of the world generally, though the competent judge will find, upon a judicious examination, the confirmation of ancient criticism in these remains; for they contain many great beauties, especially in composition, though they are evidently the works of the inferior artists of an inferior age. To judge, however, of the ancient master-pieces of art from such specimens, is tantamount to estimating the great works of modern ages by the ordinary patterns on modern crockery and French paper-hangings; to which the immense superiority of the designs on the vases and other ancient remains is some index of the excellence of the great works of antiquity, so uniformly praised by ancient writers."

"The facts attesting any great early development of portraiture among the Greeks are not numerous; yet portrait-painting is certainly coeval with painting itself; its degree of excellence of course depending upon the degree of development of the latter."

"The earliest known example apparently of Egyptian portraiture is the portrait of Amasis, mentioned by Herodotus. Amasis sent a golden image of Minerva, and his own painted portrait, to the Greeks established at Cyrene. He sent also two wooden images of himself to the Heræum, or Temple of Juno, at Samos. This was about six centuries before the Christian era. Herodotus saw these wooden statues; they stood in his time immediately behind the gates (Herod. ii. 182)."

"Greek writers do not mention any Greek portraits of so early a date as this portrait of Amasis, yet they speak of allegoric and iconic portraits of a very early period. Aristotle (*de Mirab. Auscult.* c. 99) gives an account of a remarkable production in this respect. He describes a magnificent purple shawl or pallium, ἱμάτιον, probably of Milesian wool, which was made for Alcisthenes, a native of Sybaris. It was embroidered with the representation of cities, of gods, and of men; and from the Greek word ζώδια, used here to signify the representations, it appears that the cities also, as well as the gods and men, were represented in a human form (Schweighäuser, *Animadv. in Athen.*, vol. xi., p. 47). Above was a representation, probably an allegoric female impersonation, of the city of Susa; below were figures of Persians; in the middle were Zeus, Hera, Themis, Athene, Apollo, and Aphrodite; on one side was an impersonation of Sybaris; and upon the other, a portrait of Alcisthenes himself. This shawl, the wonder of the Italiots, came subsequently into the possession of the elder Dionysius, tyrant of Syracuse, about 400 B.C., who sold it to the Carthaginians, for the enormous sum of 120 talents, or nearly 30,000*l.* Sterling. A shawl of such value, for its workmanship alone, is scarcely within the comprehension of a modern manufacturer. It was of the ordinary size, though its dimensions are not quite evident from the mere statement, that it measured fifteen cubits; however, whether fifteen cubits all round, or fifteen square cubits, it would still be of the ordinary size of a shawl of the present day. Alcisthenes lived probably about 520 or 530 years before the Christian era, and shortly before the fall of Sybaris, as from this shawl he must have lived in the most luxurious age of that luxurious city.

Nearly contemporary with this production of Sybaris, is the picture which Mandrocles of Samos, architect, dedicated in the Heræum of Samos. Mandrocles constructed a bridge of boats across the Bosphorus, for Darius Hystaspes and his army, on his expedition against the Scythians, 508 B.C. He had a picture painted, of the passage of the army across, with the portrait of Darius, seated upon a throne, reviewing his troops as they passed; and he dedicated it in the Heræum of Samos. In this picture, probably the portrait of Darius was little more than a mere iconic of the royal robes and regalia of Persia, with an indication only of the characteristic features of the king; and the figures must have been very small, or the picture very large, which is scarcely probable (Herodotus, iv. 88). The Heræum of Samos was a general depository for works of art; and it appears in a subsequent age to have been particularly rich in paintings, for Strabo (xiv. p. 637) terms it a picture gallery (πινακοθήκη). Paintings appear to have been common at this time amongst the Ionian Greeks. Herodotus (i., 164) speaks of the paintings of Phocæa, in the time of Harpagus, 544 B.C., as being reckoned among their most valuable possessions by the Phocæans. In the prophet Ezekiel, we have still earlier mention of Asiatic paintings, and indeed of costume portraits of a princely character. 'Men portrayed upon the wall, the *images* of the Chaldeans portrayed with vermillion, girded with girdles upon their loins, exceeding in dyed attire upon their heads, all of them princes to look to, after the manner of the Babylonians of Chaldea, the land of their nativity' (Ch. xxiii. 14, 15).

Statutes and portraits were, at an early period, decreed by the Greeks, as public testimonials in honour of distinguished deeds, as to Harmodius and Aristogiton; and the like honour was awarded to those who had been thrice victors at the Olympic Games (Pliny, xxxiv. 9)."

"Portrait painting was doubtless completely established in the time of Pericles. Dionysius of Colophon appears to have been a perfect master in this department, though he was not exclusively a portrait painter."

"That the Greek painters, even of this early period, were good colourists, is certain, from the very completeness of Lucian's expression (*Imag.* 7.), with regard to this important department of painting. He mentions four painters, Polygnotus, Euphranor, Apelles, and Aetion, as having best understood the proper mixing and laying on of colours. Of the correctness of their theory, we have good evidence in the observation of Plato (*De Republ.* iv. 420, *c.*), who in speaking of painting statues, says, it is not by applying a rich or beautiful colour to any particular part, but by applying its proper colour to each part, that the whole is made beautiful. Plutarch also (*Cimon.* 2.), in a later age, observes, with equal propriety, in speaking of portraits, that when a painter has a beautiful model to paint, which, nevertheless, may have some trifling blemish, he will not entirely omit the blemish, nor will he exactly imitate it; as the one would interfere with the likeness, and the other would detract from the beauty of the picture. This recalls to mind the injunction which Cromwell gave to Lely when he sat to that painter for his portrait: he said, 'Mr. Lely, I desire you will use all your skill to paint my picture truly like me, and not flatter me at all; but remark all these roughnesses, pimples, warts, and every thing as you see me, otherwise I will never pay a farthing for it.' (Walpole, *Anecdotes.*) There is another evidence of the mature age of the formative arts, and of taste, at this time in Greece, in an admirable law of Thebes, which is noticed by Ælian, (*Var. Hist.* iv. 4.) He says that all painters and sculptors who practised their arts in Thebes, were compelled to execute their own portraits or busts, to the utmost of their ability, as a proof of their proficiency; and that those artists whose works were considered inferior, or unworthy of their profession, should be heavily fined. The only obvious end of this capital regulation, seems to have been the protection of the public taste, by intimidating incompetent persons from following the arts of design as a profession. No doubt, such a law, impartially carried out, would have a very beneficial effect, in any time or place; and it might be perhaps advantageously imitated by the moderns."

"The master-piece of Apelles, says Pliny (*l. c.*), according to competent judges, was the portrait of King Antigonus on horseback. Nearly all the works of Apelles were portraits. He painted Alexander, whom he had the exclusive privilege of painting (Hor. *Ep. II.* i. 239), several times; and the price of one of these portraits, which was preserved in the Temple of Diana, at Ephesus, was alone a great fortune, and such as few painters probably have since earned during the whole course of their lives. Alexander was painted wielding the lightning of Jupiter; and doubtless, more on account of the flattery than the art, the king, according to the almost incredible statement of Pliny (*l. c.*), ordered twenty talents of gold (upwards of 50,000*l.* sterling), to be given to the painter; so great an amount, that it was measured to Apelles, not counted."

"Probably there is no use of portraits, of which we do not find mention among the Romans; and they employed them in several ways to which we have no record of similar usages since. Pliny (xxxv. 2.) has several curious observations on portraits. He says, that in olden times, that is, compared with his own time, portraits were made as like in colour and form to the originals as was possible—a custom in his time grown quite obsolete. And we have, he continues, shields and escutcheons of brass, with portraits inlaid in silver, which

have neither life nor individuality. Now, all men think more of the material in which their likenesses are made, than of the art or the resemblance. The effigies they leave behind them, are rather images of their wealth than of their persons. Thus it is that noble arts decay and perish. With their ancestors it was very different; their halls were not filled with either strange images of brass or of stone, but with the lively portraits of themselves and of their forefathers, in wax, exact similitudes. These portraits, so pathetically regretted by Pliny, were wax busts, and they were preserved in wooden shrines, in the most conspicuous parts of the house. The custom, therefore, so particularly described by Polybius (vi. 53), seems to have grown into disuse before Pliny's time. Polybius says, 'Upon solemn festivals, these images are uncovered, and adorned with the greatest care. And when any other person of the same family dies, they are carried also in the funeral procession, with a body added to the bust, that the representation may be just, even with regard to size.'"

"It was also an early practice among the Greeks and Romans, for warriors to have their portraits engraved upon their shields. These shields were dedicated in the public temples, either as trophies, or as memorials of the deceased (clypei votivi). Pliny (xxxv. 3), states that the shields, or *scuta*, were called *clypei*, on account of these portraits (imagines clypiatæ, or imagines clypeorum), which were engraved upon them. Appius Claudius, consul A.U. 259, 495 B.C., was the first Roman who dedicated such shields in a public temple. He dedicated the shields of his ancestors with their portraits and titles upon them, in the Temple of Bellona; Marcus Æmilius followed his example, and thus it became a Roman custom. They were hung sometimes on columns."

"Pliny praises in high terms another Roman custom, due to the example of Asinius Pollio, of placing the statues and portraits of authors in libraries. The portraits of authors appear to have been placed in public libraries, above the cases (pegmata), which contained their writings; and below them, chairs were placed for the convenience of readers: a delightful arrangement. Cicero, in a letter to Atticus (iv. 10), says, "I had rather lounge in the little chair you have under the portrait of Aristotle, than sit in their curule *sella*." Suetonius mentions the portraits of authors, on several occasions, in the lives of the emperors. Tiberius placed the writings and portraits of Euphorion, Rhianus, and Parthenius, among the best ancient authors, in the public libraries of Rome (*Tib.* 70). Tiberius also passed an edict respecting the public placing of statues and portraits; he allowed none to be placed without his sanction, and then only in the temples as ornaments, and not among the gods (*Tib.* 26). A similar law was passed by Caligula, who forbade the statue or portrait of any living man to be placed without his sanction (*Calig.* 34). Caligula appears to have contemplated the removal of the portraits and writings of Virgil and of Livy from all the libraries (*Calig. l. c.*)."

"Marcus Varro took extreme pleasure in portraits; he appears to have invented some method of multiplying them. Pliny's allusion, however (*l. c.*), to the fact is so very concise, that it is scarcely safe to venture upon any explanatory conjecture as to the means. He made, *aliquo modo*, and inserted in his writings, the portraits of 700 distinguished men, and dispersed them to all parts of the world (*in omnes terras misit*). And this he did for the gratification of strangers. Pliny appears here clearly to speak of more than one set of portraits, and they must, therefore, have been either repeatedly copied in sets, or printed; and if so, possibly from wooden cuts, though this is scarcely probable, or something of the kind would have been handed down, if not to our own day, at least for a few centuries, so that some traces of such an art would appear in the earliest manuscripts."

ELECTRIC TELEGRAPH STRUCK BY LIGHTNING.—The magnetic telegraph wire was struck by lightning at Lancaster, several times last week. It is too small to contain fluid enough to do harm. The sound in the office, which was accompanied by a few sparks, was like a pistol shot.—*New York Sun.*

ARCHITECTURAL NEWS FROM BERLIN.

The new Building over Kœpnik Fields.—If it be taken into account, that the increase of population in the Prussian capital has been (proportionately) as great as that of London, viz. 150,000 since 1815; if the large spaces which have been of late taken up by railway termini and public edifices are added thereto, all which has taken place at the *west end* of the town, the extension in an opposite (S.E.) direction became matter of necessity; where, fortuitously, *Kœpnik Fields*, a large sandy expanse, hitherto merely occupied by kitchen gardens, affords the widest scope. Hitherto, most of its streets and squares are only arranged on paper; several, however, are already marked out, and *Ritter Strasse* even possesses some good houses. The communication with the older districts of the town, will be effected by several demolitions and cuttings through of new streets. In this, however, northerly and barren locality, an Italian-like structure attracts notice. It is the new *Jacob's* church. A square area covered with turf and shrubbery, and separated from the street by an iron railing, is surrounded on three sides by a porticus supported by columns, to which you ascend by a few steps. Behind the middle portion of the porticus rises the church, in the old Basilica style, its front merely ornamented by a window rosette, the main nave reaching over the lateral axis; to the left of the entrance, joining the external wall of the building, is the square belfry, of four stories of arched windows. It stands, according to Italian style, by itself; while in the northern style, it seems to develope itself out of the main structure. The interior presents a three-naved space, each supported by ten pillars. It has two stories; on the pillars of the lower reposes a flat structure of joists, while the upper columns have arches, over which continues the wall with its arched windows. The tribune ends with a semicircular niche, before which stands the altar, to which you ascend by three steps. At the bottom of the lateral naves are doors leading to the vestry and *baptisterium*, which are also included in the semicycle. The decoration is simple and chaste, and the whole altogether Italian. If it is compared with others, similar Basilicas, for instance, that of St. Agnesa, on the Nomentine road, the balance will be found in favour of the Berlin structure.

At the meeting of the *Prussian Society of Arts*, a most important event took place, inasmuch as the whole council, with Mr. De Olbers at the head, resigned their offices. There had appeared of late, symptoms of opposition, putting forth that the society did not encourage the right *sort* of arts and artists—and thus a new set of laws and regulations has been called for, which will be laid before the next general meeting. Such incidents did not prevent, of course, the very courteous and hospitable reception given to the French antiquary, Mr. Raoul Rochette, who exhibited at one of the meetings of the Archæological Society, the late parts of his work on the *wall-pictures* of Pompeii, which, however, are said to be inferior in execution to those published by Ternite and Welker, at Berlin. The fine sarcophagus executed by Professor Rauch for King Frederick William III. at Potsdam, where H. M. lies close to his consort, is completed, and will shortly be accessible to public inspection.

PROFESSOR WILLIS ON ECCLESIASTICAL ARCHITECTURE.

ON Thursday, May 26th, Professor Willis commenced the subject of style and decoration in mediæval architecture. He alluded to the early origin and history of the arch, shewing that it had been known to the Egyptians, and proceeded to describe the various forms of arches, and the methods of delineating them. He suggested a simple mode of ascertaining the outline of Gothic arches, by holding a number of cardboard forms, prepared ready for the purpose, between them and the eye, and shewed, that frequently, they had their centres disposed according to a settled proportion of the opening, and that the division into three equal parts of the space was not uncommon.

In its early history, the arch had been employed in construction exclusively: a portion of the inside of the Pantheon shewed an order below, and windows above, but the arch was not at all apparent.* However, on turning to the other side, they found that the actual construction was completely different. A large arch distributed the weight of the dome to the main piers, and smaller arches beneath the first relieved the pressure from the architraves between the columns. In later buildings, the Romans, instead of concealing the arches, began to decorate them, as with an archivolt, and arranged them on strong piers in an arcade. They then added further decoration by combining them with an order, placing a column in front of the pier; and so at last the arch gained the victory. Thus we had made an important step in the progress of architecture, and had seen that the actual construction may be entirely different from the apparent construction, or that which is represented by decoration. It had been said, that the early progress of style was marked by the expression of the construction; whilst he contended, that the tendency was the reverse. He also referred to a drawing of a Moorish arch, which had on one side all the appearance of being built entirely of voussoirs, whilst, actually, on the other, the lower portions had regular courses, and belonged to the piers, the arch itself being confined to a small portion at the apex. This was the principle, which the Gothic architects adopted in their arches and vaultings.

Subsequently to the use of the arch with piers, amongst the Romans, we found the arch with columns only. Of this, he believed that the earliest example was in the palace of the Emperor Diocletian, at Spalatro. In this building there was another singular feature, namely, the entablature of an order carried from column to column as an arch.†

A change of equal importance was that in the mode of arranging voussoirs. This consisted in placing the concentric rings, not on the same face, but corbelling them over in the section of the arch,—an ingenious contrivance, and one which had an immense influence over the whole system of decoration.

The lecturer then described the system in Gothic tracery called "subordination," which consisted in the combination of patterns having a relation to each other, and made some comment upon the inattention, often shewn in drawings to the forms of the "cuspidated openings." He first placed in a frame, a cardboard representation of the first order of mouldings in a window of flowing tracery, and then shewed by other sheets, how the several ramifications and cuspidations combined. They would thus see, that unless these points and cuspidated openings were drawn with great care, the physiognomy of the window might be completely changed. He also shewed the same principle in a window of "geometrical" tracery. Sometimes the arch itself was formed by cusps and points, arranged in various ways; this was called "foliating the arch,"—he preferred to say "cuspidating the arch." In many cases, as in arches over tombs, each cuspidation was itself cuspidated, by which great richness was gained; and sometimes there was a third order of cuspidations. He then explained the principle of "perpendicular" tracery, which consisted in the great preponderance of perpendicular lines, the mullions often being continued unbroken up to the arch. But, there were other features in windows of this date, and one had not yet been much noticed. He referred to that peculiar arrangement, resembling the tiles on a roof, and which he denominated "imbricated tracery." Windows of this class were numerous, and had not generally been distinguished from those called "perpendicular."

MARBLE FOR NAPOLEON'S TOMB.—The Francesca Catharina, with a cargo of marble for the tomb of the Emperor Napoleon, arrived on Sunday at Havre, on its way to Rouen. This vessel, after having been obliged to put into Gibraltar and Lisbon, was caught in the Bay of Biscay in a violent gale of wind, which placed it in great danger, and the crew were forced to throw overboard ten tons of its cargo.

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* It was, of course, not necessary to mention another part of the building, as that does not affect the argument.—ED.

† As in the curious example at Damascus, noticed at a meeting of the Institute of British Architects, vide Vol. III, —ED.

COMPETITIONS AND ARCHITECTS' REMUNERATION.

Sir,—Much having been written in your valuable paper, respecting remuneration to architects and architectural competition, and thinking that much good may eventually be to the profession by exposing the meanness of employers in the former, and the unfairness often practised in the latter, I have copied the enclosed advertisements, which appeared in the *Hampshire Chronicle* on the 16th and 23rd inst.—I remain, Sir, &c.,

Winchester, May 16. A Subscriber.

"*To Architects, &c., Farnham Union.*

"The guardians of the above union will give *five pounds* for the most approved plan for altering the Farnham workhouse into a four-fold classification, for about 200 inmates, and for any requisite alteration in the Aldershot workhouse for the accommodation of the children of the union.

"Plans and suggestions will be received at my office till six in the evening of the 21st inst., where further particulars relative to the plans required may be obtained.

"May 9th, 1846. W. J. Hollest, Clerk."

"*To Architects, &c.*

"The guardians of the Farnham Union, not having received satisfactory plans, for altering the Farnham Workhouse into a four-fold classification union house (as before advertised) for about 200 inmates, hereby notify, that they will give *ten* guineas for the most approved plan of the requisite alteration in such house, and also for any necessary alteration in the Aldershot Workhouse, intended to be used for the children of the union.

"Plans and suggestions will be received at my office, or at the board-room, on or before Friday, the 5th of June next, at 11 o'clock.

"W. J. Hollest, Clerk.

"Farnham, May 22nd, 1846."

*** All we have to say on the subject is, that the guardians of the Farnham union ought to be ashamed of themselves; and that if they are not, we are for them. We hope sincerely, that no person entitled to call himself an architect, will be led to degrade himself and his profession by offering his services under such conditions.

PARLIAMENT AND PUBLIC BUILDINGS.

On the 26th ult., the sum of 121,578*l.* was voted by the House of Commons to defray the expense of building, and the lighting and repairing of certain public departments. It included the sum of 5,000*l.* for the repairs of Glasgow Cathedral, and 1,210*l.* for the repairs of Dunfermline Abbey.

Office for Records.—Mr. Protheroe entered a remonstrance against the continued waste of the public money for providing, temporary and very inconvenient accommodation for the public records, instead of at once placing them in a permanent building of a suitable kind. As it was, the records could not be consulted, nor their arrangement pursued with advantage, so long as they were kept in the small buildings allotted to them at present.—The Chancellor of the Exchequer was extremely anxious to afford every possible accommodation for the public records; but remarked that there were buildings at present in the course of erection, connected with the new Houses of Parliament, which would be devoted to that purpose.—Mr. Protheroe thought that a plain specimen of good architecture might easily be erected at once, and at a very small cost, for the accommodation of the public records.

Kew Gardens.—The next vote was a sum of 10,000*l.* to defray the expense of erecting a palm-house in the garden at Kew, which was agreed to.

Houses of Parliament.—A sum of 15,558*l.* to defray the expense of providing temporary accommodation for the Houses of Parliament, committee-rooms, &c., was then voted, and 72,400*l.* to defray the expense for one year of the works of the new Houses of Parliament.—Mr. Hume, seeing a charge of 2,400*l.* for fresco paintings, wished to know whether any general plan had been adopted for decorating the buildings, and what estimate had been made of the amount to be expended in this branch of art.—Sir. R. Peel believed there were two or three compartments in the House of Lords, to be appropriated to fresco paintings. The Victoria gallery was under the consideration of the commission, but they wished, before they committed themselves to any general plan, to see the effect in those two or three compartments which had been dedicated to frescos.—Mr. Hume wished to know whether the fresco decoration would be confined to the House of Lords?—Sir R. Peel did not think the House of Commons would afford the same scope for fresco decoration as the House of Lords. There had been a committee of the commission for the purpose of selecting subjects from history for fresco paintings; the committee had made a report; but the commission had not yet come to a final decision.

Board of Trade.—The next vote was 19,235*l.*, to defray the expense of taking down and rebuilding the Home-office, Board of Trade, and Council-office, Whitehall.—Mr. Protheroe wished to know whether the new frontage of the Board of Trade and Home-office, was to be extended as far as Lord Dover's house? It appeared to him as though the buildings were being patched up, and that the artist would be able to produce a better effect, if he were not trammelled with the designs of Sir J. Soane.—Sir R. Peel said that the projection of the face of the building beyond the front of Lord Dover's house, would be so slight as not to spoil the general effect.

The National Gallery.—Sir D. L. Evans inquired whether the Government were prepared to consider the expediency of enlarging the National Gallery, or of removing the pictures to some other and better place. He thought that the money now proposed to be voted might better be applied to such a purpose.—Sir R. Peel reminded the hon. member that the House of Commons, by restricting the amount which the building was to cost, had been partly responsible for the result. He did not attempt to defend the building, but the site was an excellent one, there could not be a better, and the pictures were not liable to any injury that could not be prevented. The number of applications made to the Government to sanction buildings of various kinds was so great, that the hon. gentleman must not be surprised if they refused to give any such assurance as he asked for, with respect to the National Gallery.

Works in Ireland.—A vote of 51,452*l.* was also agreed to for public buildings and works in Ireland.

ADVERTISING FOR CANDIDATES FOR OFFICES ALREADY FILLED.

Sir,—I have observed with pleasure the zeal which you have manifested for the honour of the profession, and the manner in which you have defended it from the mean opinions of mean men. I would therefore beg to solicit the favour of your attention to the facts contained in the following letter, for the authenticity of which I pledge myself. I think much good might accrue from its publication.

I am, Sir, &c. J. L. Hale.

8, Denmark-place, Well-street, Hackney,
May 30, 1846.

To the Rev. the Vicar of St. Giles', Camberwell, Surrey.

Rev. Sir,—I take the liberty of addressing you, on the supposition that you have some interest and influence in the affairs of the parish, over which it is your pleasure to officiate. I would beg to call your attention to a great grievance which obtains generally at the present time, and is extremely prejudicial to that portion of the public who, seeking situations, have already their full measure of anxiety, and, necessarily provident of their means, are less capable of bearing the trouble and expense attending useless applications. The evil of which I complain has just manifested itself in the grossest form in your parish, and subjected me to much annoyance, as will appear from the following facts. A few days ago, the following advertisement appeared in the *Times*:

"St. Giles, Camberwell, Surrey.

"Wanted, *a Surveyor of Highways*, of this parish. Security required. Applicants for the situation are requested to send their testimonials, with the names of two sureties, under cover, directed to me at the vestry hall of the said parish, on or before Thursday the 21st inst., and to attend personally at the same place on the following evening, at six o'clock precisely, to be examined as to their fitness for the office.

B. Hooks, Vestry Clerk."

I was a candidate for the office, and fulfilled all the conditions expressed in the advertisement; and my testimonials were of the highest authority. I waited an hour and a half after the time appointed, before there was any appearance of examination. Proceedings were then commenced, and carried on, I was informed by one who had the privilege of being present, in a very unbusiness-like manner. Some of the candidates only were examined; and one of them was told that his testimonials were "too good for the place," they only wanted a "common road-maker." Having waited an hour longer, during which the few candidates who had been examined once were examined again, I inquired of one of the officials how the examinations proceeded, when I was informed that business was all over. I then made inquiry for the vestry clerk, desiring explanation relative to the negligent manner in which this business had been concluded, especially as other candidates besides myself considered themselves most uncourteously treated, I was told, however, it was impossible I could see him. The following day, by request, I received my testimonials and letter of application, on which was written, "Mr. — did not attend." It would appear by this expression they intended to add insult to injury; for it is well known to the officers and clerks present, that I waited by the door of the examination room the whole time, expecting momentarily to be called in. It is clear, as I was informed in the hall, that a person had been selected to fill the office before the advertisement appeared.

Is it right, therefore, Sir, thus to defraud the public by upholding this obnoxious custom of calling upon the people to submit themselves, it may be, to the greatest inconvenience to no purpose? With regard to myself, I devoted half a day, and sacrificed important business in respect of the advertisement, and was finally dismissed without the least notice whatever. In my notions of justice and propriety, such conduct was most ungentlemanly, and reflects the greatest shame and contempt on the parties concerned.—I am, Sir, &c.

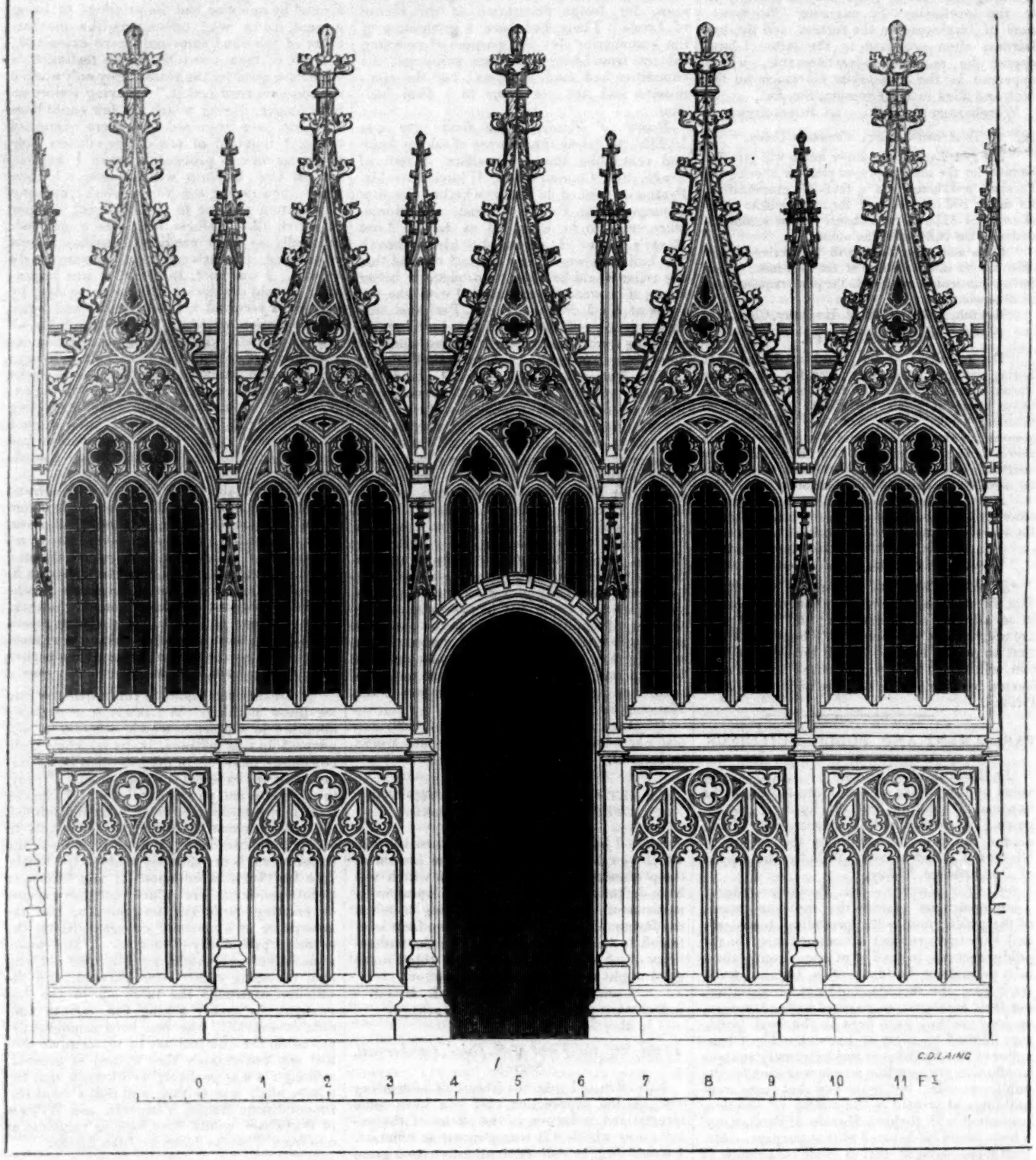
*** Of the facts stated in this particular case we know nothing. We insert it as drawing attention to a practice which, whether or not adopted in this instance, is, as we know well, constantly followed in others,—that is, of advertising for candidates for a vacancy already, to all intents and purposes, filled up. In two or three Dispensaries with which we are acquainted, the advertisement of a vacancy ("merely to satisfy the subscribers") is not inserted until the appointment is as positively made as if a formal vote had been taken upon it; and fifteen or twenty gentlemen are seduced into the expense of printing cards and testimonials, and the annoyance of a personal canvas, without the remotest probability of success. In the case of a vacant surveyorship of a public trust not long ago, the same course was pursued, and the solicitor continued the farce up to the last moment, by coolly asking the various candidates severally, who had been summoned to attend on the nominal day of election, if they had any testimonials they wished to present; although it was perfectly well known that the whole affair was settled, and that a joint testimonial from Euclid, Vitruvius, and William of Wykeham, would have been as valueless as one from Thomas Jones or John Smith.

COLLINS'S ATMOSPHERIC RAILWAY.

Sir,—In your report of my atmospheric railway last week, there is an error of so much importance to the working of the system, that I must request a correction, and the more so, as your paper is so widely circulated. You state that the apertures are opened "only while they are filled or closed by the *air-tight* fitting driving rod." Now the fact is, that the valves are not opened till the *piston head* has passed the aperture which the valve closes, the air, therefore, instead of passing in *front of the piston*, will press behind it and make up for any loss by the friction of the impelling air through the pipe; it being necessary to admit the air at intervals (to press against the piston) in a pipe of a mile or so in length; the driving rod passes through the apertures without touching the sides. Your correction of this error will confer a favour on Sir, your obedient servant, C. H. Collins.

Trinity-terrace, Southwark.

SCREEN: CANTERBURY CATHEDRAL.



SCREEN—NORTH TRANSEPT OF CANTERBURY CATHEDRAL.

The north transept of this interesting cathedral, commonly called the martyrdom, from its being the scene of Thomas a'Beckett's murder, is very rich in monumental remains; among the best may be noticed the tomb of Archbishop Warham. Contiguous to this martyrdom, on the east side, is a chapel, now called the Deans' chapel, from several of these dignitaries of the church having been buried in it. It is a fine specimen of the architecture of the latter part of the reign of Henry the Sixth, and at that time appears to have been called the chapel of the Blessed Mary; it was built by Prior Thomas Goldstone, who died in 1468. The screen shewn in the accompanying engraving separates this chapel from the martyrdom, and was doubtless built at the same time as the chapel; it stands between two of the main piers of the transept; as a composition it cannot be too highly commended: it also presents a great variety of detail, beautifully executed. With the exception of the organ-screen, it is the finest specimen of stone screen-work in the cathedral.

W. C.

*** We feel justified in pointing attention to this illustration, as an admirable specimen of wood engraving.

ON DAMP IN BUILDINGS, ITS PREVENTION AND CURE.

BY MONS. LEON VAUDOYER.*

The following paper was read by Professor Donaldson, at a meeting of the Royal Institute of British Architects, held on the 25th ult.:—

The damp which exists in buildings arises from different causes, and appears in many forms in the lower parts of buildings. In the ground floor, damp penetrates through the walls themselves having received the moisture from soil.

The walls of which buildings consist are of two kinds; of outer walls, that is to say, those which form the outward enclosure of a building; and of division walls, which, contained within the former, divide it into its different compartments. Outer walls must necessarily have, in common with all erections, their footings on the natural soil; and have, in addition, one side in direct contact with it, when not surrounded by areas or cellars in the basement story, if there be one; in this last case the contact is simply by the footings.

The nature of division walls is various; for if there be cellars, they only come in direct contact with the soil at their foundations, and all above the level of the soil in the interior, their sides will be sheltered from the influence of the external atmosphere. Let us see by what means damp is introduced into these two kinds of walls.

According to physical laws, the damp of the

* From the "Revue générale de l'Architecture," vol. v., pp. 266, 315, 350, 446. Translated by Professor Donaldson.

PLAN AND SECTION OF DRY AREA.

Fig. 1

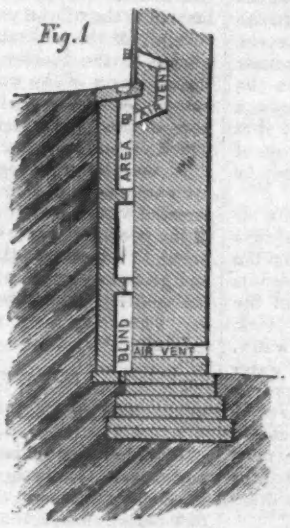
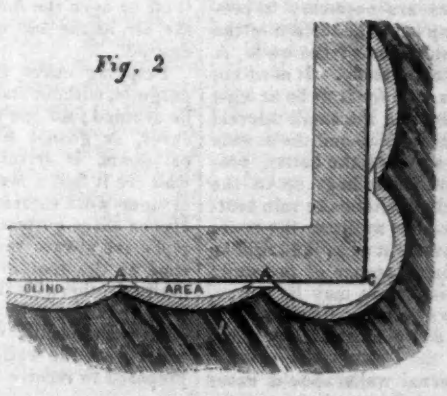


Fig. 2



soil tends to penetrate, in one direction or another, the hygrometric bodies with which it meets. It hence results, that the walls of buildings will absorb from the soil a certain dose of humidity at all the points immediately in contact with it. That is to say, if there be an underground basement, the outside walls will absorb by their footings, and by one of their faces, and the division walls by the footings alone. If there be no underground basement, the division and outer walls will be under precisely the same conditions, with respect to those parts of them below the level of the exterior surface of the soil. But are these the only causes of humidity ordinarily regarded in the lower parts of buildings? Certainly not; and it is easy to prove that, with regard to external walls, there are other causes, which, although less constant, are notwithstanding not less immediate;—we mean the rain-water, which the wind drives upon the faces of walls, by which the lower part is wetted; as well by that driven directly on the surface as by that which rebounds from the ground, or by that which falls down the face of the wall. In the case of dripping eaves, without gutters, it may be easily imagined the abundance of wet which the walls receive at the lower parts from the drips of water, and from stacks of rain-water pipes without shoes.

We may therefore consider it to be sufficiently proved that, in ordinary construction, damp enters the lower parts of buildings—1st, by the footings; 2ndly, by the walls, the faces of which are in direct contact with the soil; 3dly, by the faces of the walls exposed to rain, and the humidity of the atmosphere. It is to be understood, that the influence of these different causes operates in proportion to the nature of the soil, of the aspect of the building, of the nature of the materials employed in the construction, of the different modes of construction, and, lastly, of all the peculiar conditions to which the buildings in question may be subject.

If the lower floor of a building be covered, whether it be by any pavement whatever, or by a planking, immediately upon the soil itself, it is certain that the ground under the floor contains, first its own humidity, as also the damp which traverses the foundations of the outer walls; so that there will exist always a constant humidity throughout the whole extent of the *lowermost* floor, susceptible of exercising its influence upon all bodies immediately in contact with the surface of the soil. It has frequently been thought that, in order to diminish this influence, it was sufficient to raise the level of the lowermost floor to a certain height above the height of ground outside, if the entrance floor be the lowermost one. But these means are not so thoroughly efficacious as when there is a basement beneath, or a complete isolation under the floor, by which a thorough ventilation may be produced. And the lower parts of the external walls, the most exposed to the action of the rain, being thus below the inner surface, or floor, they cannot so easily transmit within the building the humidity which will have penetrated the exterior walls. We shall see, however, that these arrangements are still insufficient. We shall therefore lay down, in the first place, that unless there be precautions taken, the floor of the entrance story of every building placed on the level of the soil outside, and directly upon the soil inside, will take up constantly a degree of humidity. In the second place, if the level of the floor inside, be higher than the outside soil, but if it be placed directly upon the ground within the building, it will preserve very nearly the same chance of damp as in the former case, all other circumstances being alike. Thirdly, that the likelihood of humidity will be diminished, if the floor inside be placed above a basement story. And fourthly, that they will be diminished, although not necessarily impossible, if the floor be above a sub-basement, and also higher than the soil outside.

But, it must be added, that all these causes depend upon the peculiar conditions to which any buildings may be subject, and which it would be very difficult and too tedious to specify in all their detail.

The first great element of consideration is the nature of the soil; it will be at once obvious that the current of spring water will be at a higher or lower level in proportion as a building may be more or less above the level of a river, as the soils may vary in quality and are rocky, clayey, or sandy, and consequently more or less permeable, and thereby more or less accessible to water.

We need not dwell on the influences of climate, as they are too fully recognised to be disputed; but the various influences which result from the aspects of the fronts of a building, deserve consideration. The façades exposed to the west and north are injuriously affected by the temperature; whilst upon the other sides, these influences are less experienced and are counteracted by the effects of the sun.

The paving the outer surface next the building, or its being unpaved, materially affects the dryness of the inside; and the construction of numerous and full sized sewers and drains in large towns, also carries off a great portion of the surface waters; and again, an isolated building is more exposed than one contiguous to another; and also when a house is on the slope of a hill, with one part against a bank, through which the waters may flow, it is necessary to adopt precautions to prevent their penetrating the solid constructions.

No reliance can be placed on the impenetrability by humidity, of any material—wood, bricks, ordinary stones of every quality, marble, nay granite itself, are more or less hygrometric—that is to say, that plunged in water or kept in a humid atmosphere, after having been previously weighed in their dry state, there is no one which will not have acquired some addition of weight. Thus, if the base of a column be immersed in water, it will gradually rise up the shaft, and the damp never quits a body into which it has once penetrated, unless it be absorbed by the air or heat. If the upper part be dried by exposure, as soon as it ceases to be acted upon, the humidity of the lower portion will again rise to the dry part.

A wall, therefore, constructed of brick or stone of any quality whatever, will be subject to the damp which exists in the soil, and which will enter in all directions and in all parts, where the wall is in immediate contact with the ground. The extent to which this damp will penetrate, cannot be determined, and it may rise to a very great height above the level of the soil; and if it be arrested more or less, that will be caused by the influence of the neutralising power of the temperature of the atmosphere; so that a wall, which may be very damp at the beginning of summer, will be much less so at the end of the dry season, and particularly so if immediately exposed to the sun, but the following winter the damp will return, unless the original causes of humidity be subdued.

The Inconveniences of Damp.

1. Unhealthiness. 2. The destruction of all perishable objects within its reach. And 3. the gradual deterioration of the structural parts of the building. On the outer faces, the action of wet commences by the joints, the mortar generally being more penetrable than the stones which it unites, hence it decays, the joint gets gradually freed of the mortar, and the damp, from the very nature of the cavity, comes in greater abundance, undergoes all the alternations of heat, cold, and frost, gradually decomposing the stone with which it is in contact. The wet then generates vegetation, another active agent of destruction.

Some persons have imagined it a sufficient remedy to render, or cover, the inside of a damp wall with a strong cement; but such an application is worse than useless; for it not only prevents a wall from becoming dried by the action of the air on the surface, and thus retains the damp in the body of the wall, but the wall, once thoroughly saturated, and acted upon by damp from one side or from the footings, will throw off any coating upon the face opposite to that on which the wet enters. To a certain degree, the entrance of wet may be arrested by coating the *outer* face of the wall with a strong cement, but there is no fully effectual obstruction to damp, but an open space through which the air may freely circulate. Hence the evil must be taken at its very source and origin, and the first access of wet to the wall must be prevented.

We will then begin with the foundations. It is desirable in all and every class of soil, to have a substratum of concrete under the foot-

ings. For the purposes of damp this need not be very deep, perhaps not exceeding a foot high. As soon as the footings and lower part of the wall are carried as high as the level of the ground inside, it will be well to introduce a thin sheet of lead the whole thickness of the wall, or a layer of bituminous substance as thin as possible, so as to penetrate the brick and stone and fill the pores, or a double course of thick slate set in cement.

The purpose of the sheet of lead and of the bituminous substance, and the slating, is to prevent the wet from rising up from the footings. But other precautions are necessary to prevent the access of damp from the surface of the ground next the outside face of the wall. A facing of stone is the best remedy. It need not be very thick, but it is well for it to be at least two or three feet high; and if a small interval be left between this facing slab and the outside surface of the wall, so much the better, providing a circulation of air be kept up in the space. By this provision neither the rain beating against this part of the wall, nor the water returning from the pavement or ground, will be able to reach the main substance of the wall; for although the facing slabs may be temporarily damped, they will soon be dried without communicating the damp to the body of the wall.

The inside of external walls should never have the plastering applied immediately on the face. They should be battened by means of long narrow slips of wood, attached by boldfasts to the inside face of the wall. These slips or battens receive the laths upon which the plastering is applied. The space formed by the battens between the wall and the lathing effectually keeps out the humidity.

No impervious covering should be laid on wooden floors in the lowermost story, such as oil-cloth, for instance; a certain moist air always rises from the ground, and escapes through the joints of the boards, but if this be intercepted by an oil-cloth, the air will rot the boards and oil-cloth in a very few months.

But it is important to keep the damp from the floors which come upon the ground, that is, the floors of the lowermost story. It is evident that the timber or stone slabs should not be in immediate contact with the soil; for this purpose, let a stratum of concrete be laid over the whole surface of the house, six or nine inches thick at the least. Upon this form sleeper walls or piers up to the necessary height, and on them lay the plates or paving slabs; as an additional precaution, a thin sheet of lead might be laid under each pier on the bed of the sleeper walls. In palaces, as a greater precaution, and in buildings where expense is a secondary object, a thickness of asphalte might be laid on the concrete. In the dwellings of the poor it is expedient at all events, to have the sleeper walls or piers, which need be only half brick wide, and one course high, without the cement, and generally that will be a sufficient precaution; where stone paving forms the floor, bricks must be laid under all the joints. Thus will the humidity be more or less prevented from reaching the floors.

But of all precautions to prevent damp entering by the face of the wall, the best remedy is to have an area, which, by keeping the soil at a distance, precludes its fatal effects on the wall. These areas may be three or more feet wide, and may serve as a passage all round the building, and afford access to cellars outside, as in the London houses; or if this, from want of space or the expense, be impracticable, it will be sufficient to have what are called blind areas, with convex walls against the earth, the points of contact with the outer wall of the house being as small as possible, to diminish the possibility of the communication of damp. Care must be taken to leave openings at AAA (fig. 2), so as to maintain a draft or circulation of air throughout the several areas; and to render this circulation perfect it will be requisite to form in the wall three or four shafts, as BB (fig. 1), to keep up a communication with the outer air. It is necessary to leave the angle, C, quite free and clear, for the angle at C being a solid mass, requires the greater exposure, that it may throw off the damp, which it originally acquired by exposure to the atmosphere, as it tends to make it evaporate. The top of the areas must be covered by stone slabs, which it is desirable to keep above the surface, and the face of the wall immediately above should be rendered with cement. If it be necessary to have the covering slabs below the earth, the face of the wall must be rendered with cement, or the damp will undoubtedly penetrate through the wall from the slightest depth of ground next to it.

Another precaution must always be taken in regard to floors, and that is, to insert in the outer walls iron gratings, with channels in the wall, say 9×6, so as to let air pass into the floor from the outside; and in order to exclude the air from the floor in winter time, or in the event of damp weather, it is well to prepare a sliding plate in the skirting, which may shut it off or open the holes for the re-admission of the air, as the one or the other effect may be desired.

Dripping eaves and rain-water shoots or gurgoils, without standard pipes, should always be avoided; for the water, which falls from the eaves, or gushes from the projecting spouts or shoots, is driven against the face of the wall ere it falls a few feet, and keeps the brick or stone-work saturated at times with the water. Hence eaves-gutters, and standard rain-water pipes are always indispensable, and a proper shoe at the foot of the pipe should never be omitted, otherwise the force of the water causes it to undermine the wall, producing the most disastrous results, whereas a shoe keeps the water from the wall, and turns it into a drain prepared to receive it.

CONSIDERATIONS WITH RESPECT TO FEES TO DISTRICT SURVEYORS.

Sir,—Is it too late to offer a suggestion in connection with the amendments of this Act,—an Act which, by the way, has in my opinion been brought to some extent into undeserved disrepute? The present system of requiring the builder, to pay large fees to the district surveyor personally, has a tendency to produce a bad feeling, on the part of the builder, against the district surveyor, the consequence of which is an inclination to run counter to the district surveyor, and also to evade his supervision; and which ends, in many cases, in litigation, to the prejudice of the Act which it is his duty to enforce. That a vigilant officer of inspection is required, to see the directions and restrictions of this important Act properly and uniformly observed, seems to require no better proof than is afforded by the number of cases of irregularity which, published documents inform us, have been prosecuted by the several district surveyors since the Act came into active operation, after making every allowance for the obtuse character of some of its prescriptions. With a view to relieving the district surveyor, in some measure, from the objectionable duty of exacting fees from the builder, I would propose that no fees (except merely nominal fees) be payable by the builder to the district surveyor; but that, in lieu of this system, the fees due to district surveyors should be raised by some new rate, or by increasing some one or more of the present rates; the district surveyor receiving, as at present, a fee on each individual work, from the parties authorized to disburse such moneys. It may here be urged as an objection, that the party arranging the district surveyor's account, would not be capable of judging of its fairness. To meet this, it would be necessary that such account should be audited at the office of the official referees; the periodical returns of the surveyor being kept for this purpose according to a form to be prescribed by law, making a heavy penalty the consequence of exacting any fee wrongfully. Another difficulty may possibly be anticipated here, viz.: that the builder, not being any longer interested in the amount of fees, might be instrumental in unduly swelling the district surveyor's account, by the service of a multiplicity of notices. To obviate this apparent difficulty, it may here be necessary also to impose heavy penalties in case of connivance; and, further, in every instance, still to make some nominal fee payable by the builder to the district surveyor, and this, too, at the time of serving the notice to begin. The inconvenience of waiting the expiration of his notice (always a source of annoyance to the builder, but which should then be strictly insisted on), would also tend to lessen this difficulty. Again, with a view of ensuring a fair and equitable audit of the periodical returns, a general surveyor should be appointed (to be paid by a fund to be raised in the districts jointly), to make periodical visits to the several districts, to satisfy himself, especially as it regards extraordinary works—that is to say, any operations except the erection of new buildings—as to the propriety of the district surveyor's demand; and to facilitate this examination, the district surveyor should be required to furnish to the official referees a duplicate of his receipt, for the preliminary fee, and of his certificate to the builder, vouching for the conformableness of the works to the Act, on the completion of the works—a form which is not now adopted, but which would then be a great check on any irregular proceedings.

It may be urged against this scheme, that the community at large are not sufficiently interested in this matter to allow of the adoption of the proposed tax; but it should be remembered by objectors, that the more important and primary objects of the statute seem to be, the security and comfort of the public.

I am, Sir, yours, as heretofore,
London, May, 1846. Συνεργος.

NOTES IN THE PROVINCES.

A joint parochial cemetery for all the parishes in Cambridge, except St. Giles's and St. Peter's, is about to be constructed.——A new parish church is to be erected at Burslem.——The Bible Christians at Morchard Bishop laid the foundation stone of a new chapel on the 11th ult.——The church spire at Chester-le-street, Durham, has been struck by lightning, and much shattered.——The first stone of St. Paul's church, Hull, will be laid on the 19th inst. Endeavours are being made to convert the ground, formerly the site of the Spring Ditch, into a promenade, and plant it with trees.——Mr. Barry, we are told, has been recently authorized by the Scarborough Cliff Bridge Committee to proceed with the erection of the sea-wall from the spa to the bridge.——The Grimsby dock works are in rapid progress.——The Manchester baths and wash-houses, in Miller-street, are to be fitted up with a supply of eighteen baths, and twenty-six troughs for linen-washing; the Manchester and Salford water-works to supply the water.——Muspratt's great brick chimney at Liverpool, lately saved its proprietors the trouble and expense of taking it down, as was intended, by toppling to the ground within the small yard in which it stood. It is thought that the chemical vapours constantly passing through it had injured the materials or destroyed their cement. A new chimney stalk is to be erected on its site, but not one of equal dimensions with the former, which was thirty feet diameter at the base.——Another new church is in progress in the Vale of Neath, parish of Lantwit.——An engineer has been lately preparing the way for the improvements at Holyhead harbour.——Public rooms for literary, scientific, and commercial purposes are about to be erected at Gloucester, including a museum, library, and theatre.——A museum at Chelmsford is also talked of.——The vicinity of Bedminster-bridge has been of late considerably improved by the heating and ventilating company. It is proposed to erect the cattle market on the site of the ruins which still disfigure that part of the town.——The people of Taunton seem to require to be reminded of their intention to establish public baths there.——The first stone of the British school-room at Tiptree-heath was laid on Monday week.——The Wrexham new market is to be in the Tudor style, after a design by Mr. Thomas Penson, surveyor for the county of Denbigh; it includes room for a corn exchange, &c. The estimate is 5,000*l*.——The water-works at Halsted are likely to be soon carried into execution on the plan of Mr. C. D. Hustler.——The Wesleyan Methodist chapel at Tisbury was opened on the 10th ult.——The first stone of the Cantley schools was laid on the 26th ult.——Mr. Lardner, cotton-spinner, Preston, has the credit of recently erecting a bath-room for his working people, including warm and vapour baths and shower bath, all fitted up in a comfortable style, with every requisite.——The select committee on the Edinburgh water-works have reported that the introduction of the bills both of the Edinburgh and of the Leith water-company, should be suspended till a bill for the supply of water to Edinburgh and Leith, under a public trust, be introduced, and passed, if possible, during the present session.

RAILWAY JOTTINGS.

From returns obtained by the *Railway Chronicle*, of about 500 miles of railway now under construction, it appears that there are now employed on these 29,000 men, and 3,000 horses; and as this calculation comprehends one-fourth part only of the lines now in progress, it is assumed that 120,000 men and 12,000 horses constitute the total number employed. The wages paid for these amount to 500,000*l.* per week, or 26,000,000*l.* per annum. Half as much more is also further expended indirectly on labour connected with railways, as in preparing rails, chairs, stock, &c.; and on land and other materials as much more. Moreover, by the engineers' returns, it appears that in order to complete the works *in time*, an additional supply of nearly 20,000 men is required; or that the proper numbers that should be employed are 48,000 men and 5,000 horses. But these additional men *cannot be obtained*, and any attempt to increase the supply will only enhance prices beyond all probability of profitable investment.——The past week has been remarkable for the number of railway meetings held in compliance with the sessional orders; and in nearly every instance the resolution come to has been to proceed with the bills; but it is thought, notwithstanding, that by aid of the dissolution bill, there will be "a regular weeding process before three months have passed away." Sir R. Peel has stated in the Commons, that he is not prepared to advise that there should be any limitation fixed on the capital to be embarked in railways.——In respect to particular lines, this week there is very little matter of general interest to record.——Mr. Hind, of the Regent's-park Observatory, has reported to Mr. Stephenson, the results of his experiments with mercury at Kensal-green, from which it appears, that at a distance of 644 feet, a down-train, twenty seconds in the tunnel, produced not the slightest vibration, and that the distance where the vibration becomes sensible, and beyond which the trains will have no perceptible effect in this locality, is 609 feet. The amount of vibration at this distance being as 1, that at 60 feet is as 100.——A pointsman on the Northampton and Peterborough line has been very properly committed to prison for two months with hard labour, for employing his time in the formation of mouse-traps while he ought to have been turning points at Plisworth.——The result of the Derby at Epsom was made known at Cambridge by the electric telegraph at half past four o'clock instead of eight P.M., at the earliest as heretofore. The telegraph on the Eastern Counties' line has been for some time completed as far as Chesterford.

DECORATIVE ART SOCIETY.

May 13th.—A paper "On Ornamental Floors" was read by Mr. Laugher. This subject was treated principally with a regard to modern appliances, and more particularly to the use of parquetry (or inlaid wood) in our principal apartments.

Several observations, however, were made respecting the pavements and floors of antiquity, of which several familiar imitations were referred to, in the painted floor cloths of the present day. It was observed, that boarded floors (usually of oak) were considered a very distinctive appurtenance to the English mansion in the 17th century, and that they received increased attention to ornamental effect in the early part of the 18th century, at which period the parquet floors had obtained considerable favour and were constructed at great cost. Carpets of home manufacture then began to enter into competition with them, and the use of foreign deals (which from their shrinking, rendered carpeting more essential to comfort) tended to the disuse of this superior kind of flooring. It was remarked, that at present, there was a revival in the feeling towards parquetry, and some explanations were given of several applications of steam and machinery (by Messrs. Steinitz and Co.) for accelerating not only the production of the geometric forms of the component parts, but ulterior processes of framing and construction, whereby considerable economy in time, labour, and cost resulted. Several observations passed upon the relative cost of parquetry, and it was said, that its price laid down marginally in dining-rooms, does not now exceed four times that of its imitation on painted cloths, and that for drawing-rooms, it is not more expensive than the richer kinds of carpet.

The advantages arising from having an inlaid margin of hard polished woods, were enumerated, and recommended to those who care to discriminate in such matters.

HABERZETTEL'S PICTURE OF JOHN THE BAPTIST PREACHING.

We briefly alluded to this fine work of art last week. It was produced in Rome by its author, after a residence in Italy of twenty-two years, and is the result of much careful study conjoined with skill. The scene is near the Jordan; the time, evening. St. John stands on an elevated piece of ground and speaks; around him are grouped infancy, youth, and age; the devoted, the converted, the sceptical. The expression of every head varies; each figure plays a necessary part in the picture, yet all point to, and are subservient to, the one impression. All are regarding the preacher, though with different feelings, with the exception of a mother, in the foreground, who seeks to pacify her infant. The variety of character, expression, and condition, judiciously introduced, the careful painting and finish of the picture, notwithstanding its great size, and the number of figures presented, and the elevated tone of the whole composition claim for Mr. Haberzettel our warmest praise.

OXFORD ARCHITECTURAL SOCIETY.

A meeting of the above Society was held on Wednesday evening, May 20th, the Rev. the President in the chair. The following new members were elected:—George Buckle, M.A., Oriel College; Charles Felix Verity, Lincoln College; and J. S. Gilderdale, Oriel College. The Hon. Secretary read the report of the committee, announcing the completion of the "Guide to the Churches in the neighbourhood of Oxford," the last part of which, and the entire volume, are now ready for sale; and also the immediate prospect of the publication of Mr. Petit's paper on parochial church architecture, which was read before the society last term. The progress of the works at Dorchester was next alluded to. The great east window is the part to which the attention of the subcommittee is now mainly directed, for the restoration of which Mr. J. P. Harrison has furnished a design, which will be executed as soon as the working drawings are finished. The subscription lately raised by the liberality of several members of Oriel College is to be applied in the first instance to the restoration of the beautiful and dilapidated buttress at the south-west corner of the church, from which it is hoped that the repairs may be extended to the whole west-end of the aisle, including the re-building of the gable, and opening the west window. The roof of the sacrarium and the east window were suggested as proper objects for similar undertakings, on the part of individuals or societies. The estimate expense of the former is 191*l.*; of the latter 150*l.* The Rev. J. L. Patterson, treasurer, read a letter from the very Rev. the Dean of Hereford, in which he expressed his willingness to accept the office of local secretary to the society, and gave some account of the finial from Bp. Aquablanca's tomb in Hereford cathedral, of which he had presented a cast. This finial being the only one on the tomb which bore the crucifix, had probably, for that reason, been concealed, and was lately discovered in the cellar of a dwelling-house near the cathedral. Mr. G. W. Cox, of Trinity College, then read a paper "on the Choice of Sites for Religious Buildings." Mr. Freeman inquired, if any member present could account for the very frequent occurrence of a small church immediately contiguous to a large one. He instanced St. Margaret's and the Abbey, Westminster; St. Nicholas' and St. Mary's Abbey, Abingdon, and others. Mr. Brooke supposed, that in such cases the smaller church was built for the use of the dependents on the abbey.

The Wellington Statue.—In spite of the unanimous expression of public disapprobation, the works appear to be proceeding with inside the archway.

PEMBURY NEW CHURCH, TUNBRIDGE WELLS.

This church, of which the first stone was laid by the Marquis of Camden on the 11th of May, is intended to accommodate 271 adults and 95 children. It is to consist of a nave (with north and south aisles), chancel, tower and spire at west end of south aisle, and a north porch. The style adopted is perpendicular or third pointed. It will be built of stone given by the Marquis of Camden. The estimated cost is 1,900*l.* Mr. Constable, of Penshurst, is the builder. A local paper, describing the ceremony of laying the first stone, says coolly, "We had *almost forgotten* to mention, that Mr. E. N. Stevens, of Tunbridge Wells, is the architect." The gentleman who gives the luncheon, of course, and the Mr. Smiths and Mr. Jones who are present, are all duly mentioned on these occasions, but as to the architect, "the man who makes the drawing and just calls in now and then to see how the men are getting on," it is usually quite by accident if he is mentioned at all.

INSTITUTION OF CIVIL ENGINEERS.

May 26th, 1846. Sir John Rennie, president in the chair.

The paper read was "A memoir on the resistances to Railway Trains at different velocities," by Wynham Harding. The paper commenced by describing several series of experiments which had been made by different persons, with a view to determining the resistance at various velocities; some new experiments made by the writer on broad guage and atmospheric lines being given in detail. Great difference of opinion on the amount of resistance prevailed in 1837, when a committee of the British Association examined the subject, and reported upon it; notwithstanding this, it was found in 1845 that the estimates taken by some engineers, of the resistances per ton at high velocities, exceeded those acknowledged by other engineers by as much as 300 per cent.

It appeared that the same low estimate of resistance was advanced by the advocates of the broad gauge, before the gauge commissioners. It became, therefore, a matter of great interest, both in a theoretical and practical point of view, to determine which of these two estimates (differing thus widely) was correct, and the inquiry was stated to have been facilitated by the application of two novel and direct modes of measuring resistances, recently afforded to engineers by the Atmospheric Railway apparatus, and the application of Morin's dynamometer to determine the tractive force required in propelling railway trains, as used by Mr. Scott Russell in his experiments. In arranging the vast number of results afforded by experiments, the author proceeded on the following principle: he collected together all the results of experiments which exhibited uniform velocities maintained on a calm day, and on a line free from sharp curves; these results he calculated and projected in diagrams, and he shewed that between these results there subsisted the most satisfactory agreement and consistency.

He argued that the fact of the agreement of so many experiments, made by different persons, with different objects, on different lines of railway, during the last seven years; the resistance being measured in no less than four different ways, leads almost irresistibly to the conclusion, that the increase of resistance with the velocity was such as these various experiments indicated.

The result was, that the resistance per ton to a passenger train of say 30 tons, at a speed of sixty miles per hour, would be upwards of 50 lbs. per ton instead of 18 lbs. per ton, or nearly three times as much as had been estimated by some engineers.

The author in pointing to the results of these experiments stated, that he desired not to express any opinion in the paper, on the advantages or disadvantages of the atmospheric system, or upon the other practical points referred to. He then proceeded to apply to the experimental facts, a formula expressing the law suggested by Mr. Scott Russell, which appeared to afford results closely agreeing with the experiments.

The paper concluded with some remarks on the application of the experimental results

exhibited, which demonstrated the great increase of resistance with the velocity (it being with a light train four times as much at sixty miles an hour as at ten miles an hour), to the calculation of the power of the locomotive engines, to the propelling power, which he contended must be provided in the atmospheric system beyond that which had been calculated upon as necessary, to the questions of gauge and of gradient; on all these points, the law which at present appeared to be established, had, he stated, the most direct and important bearing, and the doctrines and modes of calculation till recently in use as regarded propulsion on railways, would, he believed, require great modification. The paper was illustrated by several tables and diagrams.

A gas burner of a novel construction was exhibited. The principal feature was the introduction of a stream of air to the centre of the flame, by means of a hollow button in the middle of the burner. The air passing up through the hollow stem of the button, was heated, and passed out by two series of five holes around the periphery, and impinging with more force with the flame of the gas curved it outwards in the shape of a tulip, while the oxygen of the air mingling with the carburetted hydrogen gas, produced a very perfect combustion. It was stated, that in comparing the consumption of these burners with that of the concentric ring burner, and trying the power of the two lights with the photometer, the new burner gave a better light with a saving of rather better than one-third of the gas consumed. It was, we believe, called the universal burner, and was introduced by Mr. McNeil.

DR. CARUS ON THE "CASTLES" OF THE ENGLISH.

This intelligent foreigner, in treating of England and "the remarkable and highly inventive race of men" who dwell within its sea-girt limits, very naturally associates the separation of our domiciles with the reservation of our manners, and he might, perhaps, have added, with the insulation of our soil.

"Up to the present moment," says he, "the Englishman still perseveres in striving after a certain individuality and personal independence, a certain separation of himself from others, which constitutes the foundation of his freedom. This, too, was completely an ancient German tendency, which led our remote ancestors to prefer the rudest and most inconvenient, but isolated homesteads, to the more convenient and refined method of life in aggregation: it is this that gives the Englishman that proud feeling of personal independence, which is stereotyped in the phrase, 'Every man's house is his castle.' This is a feeling which cannot be entertained, and an expression which cannot be used, in Germany or France; in which countries ten or fifteen families often live together in the same large house. The expression, however, receives a true value when, by the mere closing of the house-door, the family is able, to a certain extent, to cut itself off from all communication with the outward world, even in the midst of great cities. In English towns or villages, therefore, one always meets either with small detached houses, merely suited to one family, or apparently large buildings extending to the length of half a street, sometimes adorned like palaces on the exterior, but separated by partition walls internally, and thus divided into a great number of small, high houses, for the most part three windows broad, within which, and on the various storys, the rooms are divided according to the wants or convenience of the family: in short, therefore, it may be properly said that the English divide their edifices perpendicularly into houses, whilst we Germans divide them horizontally into floors. In England, every man is master of his hall, stairs, and chambers; whilst we are obliged to use the two first in common with others, and are scarcely able to secure ourselves the privacy of our own chamber, if we are not fortunate enough to be able to obtain a secure and convenient house for ourselves alone."

DESTRUCTION OF AN ANCIENT CHAPEL.—The picturesque little chapel opposite the toll-bar at Kingland, is now being unroofed, preparatory to its destruction, by the sanction of the governors of Bartholomew's Hospital.

New Books.

A Treatise on Railway Surveying and Leveling. By JOHN QUESTED, *Surveyor.* London; Relfe and Fletcher, 1846.

"The increasing number of railroad undertakings," says Mr. Quested, in his preface, "having given rise to an unprecedented demand for practical surveyors, has caused many young persons to embrace that profession, who were balancing within their own minds to what pursuit to turn their attention.

Many who wish to do so, may not have the means within their power of gaining instruction from practical men; and almost all the works on surveying which give a theoretical knowledge of this art to the extent required by railway surveyors, are elaborate, and so mixed up with other subjects, that the pupil, on opening the book, is startled at the vast quantity of matter he must wade through, in order to acquire that instruction he wishes."

His object has been to clear the road a little, by avoiding extraneous matter, and confining himself to practical work; and in this he has certainly succeeded to a considerable extent. His little book will be found of great service, by all who wish to acquire an insight to the art and mystery of surveying, and have not a long time to acquire it in. His closing piece of advice to railway surveyors may be usefully repeated: —

"Let me earnestly advise his laying down every night all the lines he has surveyed in the day; let no *fatigue*, no *disinclination*, and no *invitation* suffer a departure from this principle. The advantage of following it is obvious; for, as the surveyor daily proceeds along the line, he necessarily becomes more and more distant from his first work, and if the plotting be neglected for some days, and it should happen that an error had been made at the onset, much trouble, great loss of time, and galling mortification must ensue, before the error can be rectified; miles must perhaps be retraced; and even on the arrival at the place where the mischief had occurred, all visible signs of stations, &c. &c. might have disappeared. Besides, the handsome remuneration generally given to railroad surveyors, should act as a stimulus for conscientious exertion, in the performance of a duty at once onerous and important. On their correctness depends in a great measure the fate of the bill in committee, and in its ultimately receiving the sanction of the Legislature. Inaccuracies detected by an opposing party tend to the rejection of the line; and in its overthrow are destroyed the hopes, both commercial and pecuniary, of the projectors."

The Elements of Architecture. By the Rev. J. W. MC GAULEY. Dublin, Mc Glashan; London, Orr and Co.

THIS will be found a very useful introduction to classic architecture, in a condensed and cheap form. The technical terms are defined clearly at the foot of each page, and render it a glossary as well as a connected treatise. "You are to observe," says our author with justice, "that technical language and rules, if you would make them really useful, must be not only *distinctly understood*, but also learned and *remembered* as familiarly as the alphabet, and employed *constantly*, and with scrupulous exactness; otherwise technical language will prove an incumbrance instead of an advantage, just as a suit of clothing would be, if instead of putting them on and *wearing* them, you were to carry them about in your hand."

PORTRAIT OF MR. WELBY PUGIN.—Many of our readers remember Mr. Herbert's portrait of this distinguished architect, in the Royal Academy Exhibition, last year, and will be glad to hear that the able artist has himself engraved it for distribution. It is published by Messrs. Hering and Remington, of Regent-street, in whose establishment will be found a good collection of modern foreign works on architectural ornament.

ST. ALKMUND'S NEW CHURCH, DERBY.—The top stone of this spire was raised on Wednesday last. The spire, with vane, is 214 feet high, being 28 feet higher than All Saints.

Correspondence.

KENTISH RAG-STONE.

SIR,—In THE BUILDER of May 23rd, I perceive you introduce some extracts from Mr. Whichcord's work on "Kentish Rag;" I would beg to observe, that by the list of prices quoted therefrom, the public are likely to be led into error, as the price of the material is in a great measure regulated by the supply and demand; in fact, I can speak from experience, as I know that last year the price was much increased, by freights being higher, owing to the great demand for barges, and consequent rise in freight; and with regard to dressed stone, such as headers, &c., should there be many required, they would immediately rise in price, as there are not many quarries whence they can be procured in any quantity, and even those could not provide more than their usual quantity, without sustaining loss in their portion of the stone made use of for other purposes; therefore there is every reason to suppose that there would be an advance in price should that be the case.

From your extract from Mr. W.'s work the inference would be, that the price would apply to the stone which he terms the best, viz. the "Boughton stone;" now that is not the case, as the shortest distance it could be brought to be shipped, would be nearly four miles; consequently the land carriage would prevent its being delivered in London at the prices named; it must therefore only apply to those quarries contiguous to the river, and from which very good stone can be procured.

My reason for troubling you is, that I thought parties who were likely to use this stone would, probably, in making estimates, take those prices as a guide, which they might afterwards find erroneous.

I have often felt surprised, that Kentish rag has not been more generally used in its rough state, as any quantity of it could be procured, at a very low price in comparison to brick; in fact, about one-third, labour included; and for foundations, garden walls, areas, &c., it is most admirably adapted; and there can be no question of its strength and durability. I can only account for it by the public not being sufficiently acquainted with it; but when that is the case, I have no doubt it will be used most extensively.

If you think the foregoing remarks worthy of your insertion, I shall feel obliged, and remain, Sir, yours respectfully,

June 1, 1846. A SUBSCRIBER.

THE WORKS IN ELY CATHEDRAL.

SIR,—In an article in the BUILDER of today, under the head of "Ely Cathedral," an apprehension is expressed that "certain arches in the western tower are being cut away, and that their removal may, very probably, endanger the fabric." Should you not receive during the coming week, any official or authorized communication from parties able to inform you more conclusively as to the facts, I will just mention what occurred while I was at the cathedral, as a passing visitor, about a month since. Perceiving that workmen were engaged in the first story of the tower, I was, upon inquiry, informed by the verger, that some modern plaster arches (mock groining in fact) not half a century old, were being removed, to throw open the interior of the tower to view from the floor of the church. I was not long in doubt as to the general accuracy of the statement; for while there, much of the lath and plaster was knocked down, and enveloped the entire west end of the cathedral in clouds of dust.

Having entered with a thoroughly wet coat, from a heavy shower of rain, I felt no inducement to verify the report made to me, by a minute investigation, which, under my then circumstances, would have been attended with very disparaging effects upon black cloth, so I made a hasty, though a reluctant, retreat; from these data, however, I am really induced to hope, for the credit of the conservators of this splendid temple, that the complainants' lament in the present instance, if it do not end in smoke, will end in this dust, and nothing more. With every respect, Mr. Editor, notwithstanding, for the right good conservative principles you evince for our time-hallowed structures, allow me to subscribe myself your friend and well-wisher,

London, May 30, 1846. MINIMUS.

PADDINGTON POOR HOUSE.

SIR,—The *Guardians of the Poor* of Paddington parish having advertised for tenders for a new workhouse, to be built at Paddington, I, with several others, tendered, when we were informed that neither tender would be accepted, as they all came to too much money. Since that, we have all been written to by the surveyor, saying, that the drawings were altered, and asking us to tender again. We have done so, and the following is the result:—

	£.
Cooper and Davis	8,337
William Higgs	8,259
Gerry	8,190
Higgs and Son	7,869
Crook	7,761
Homan	7,489
Burton	7,471
Wilson	7,390
Cooper	7,228

Mr. Homan's tender was accepted. Now, what I complain of is, that as each builder was written to, the surveyor must have thought them men of sufficient respectability to finish the job, or he most certainly would not have written to them; then why was not the job given to the lowest, especially as each was prepared with securities? And I am sure no one can complain of the tenders; I think them very fair, to what we sometimes see. But there is no doubt it was done (as kissing goes) by favour; if so, I think you will hold with me, that the builders who are lower than the accepted one ought to be remunerated for their trouble.—I am, Sir, &c.

A COMPETITOR FOR THE PADDINGTON
3rd June, 1846. POORHOUSE.

*** We agree with our correspondent in thinking, that if a builder be *invited* to tender, it is an assurance that he is considered a proper person to execute the works; and, if no stipulation to the contrary, that his tender if lowest will be accepted.

Miscellanea.

A TUNNEL UNDER GREENWICH PARK.—It has been determined by the directors of the South Eastern Railway Company, to pull down the Greenwich terminus, the Railway Tavern, (known as the Prince of Orange), together with several shops and newly-erected dwelling-houses adjoining, and to erect a splendid terminus on Croom's-hill in its stead, alongside one of the smaller entrances into the park. The new tunnel will commence at the Creek-bridge, which separates Greenwich from Deptford, and continue under the town of Greenwich, the lower part of the park next Greenwich Naval School, Maize hill, onward by the back of the union workhouse in the Woolwich-road. Here the tunnel is to end, and the line continue forward to Woolwich, Dartford, Gravesend, &c. From the estimates made by the surveyors, the directors consider that they shall be able to complete the works to Gravesend, and open it for public traffic, in the course of the next twelve months. The tunnelling is intended to obviate the vibration complained of as likely to arise, and which the astronomer royal considered would affect the scientific studies of the Royal Observatory.—*Observer.*

EXTRAORDINARY ESCAPE AT SHEFFIELD.—On Monday last, a long ladder was placed from Church-street to the top of the Sheffield and Rotheram banking company's premises, the roof of which was undergoing some repairs. A gentleman who had business at the bank, incautiously fastened his horse's bridle to the lower part of the ladder while he went into the bank. Directly afterwards, the man who had been on the roof of the house got upon the ladder to descend into the street. The instant the horse saw the man's figure above him, he made a bolt, and pulled the ladder into the street. On feeling the ladder slipping from under him, the bricklayer caught hold of the parapet and succeeded in gaining the roof again, or his death must have been inevitable. The ladder was broken in two, near the top, but fortunately fell upon nobody who was passing.

Six thousand pounds have been devoted by the Legislature of Jamaica to the building of churches; 300*l.* has also been set apart for erecting schools.

TENDERS.

For erecting a house in Lombard-street, corner of Birchin-lane, for Messrs. Overend, Gurney and Co. Mr. Henry Baker, architect.

Mansfield	£10,900
Bridger and Ashby	10,481
Grissell	10,426
Piper and Son	10,399
Grimsdell	9,800
Lee and Son	9,800
Wm. Cubitt and Co.	9,670

The quantities were taken out by Mr. Meredith and Mr. Nicholls, and the tender of Messrs. Cubitt was accepted.

NOTICES OF CONTRACTS.

[We are compelled, by the interference of the Stamp Office, to omit the names of the parties to whom tenders, &c. are to be addressed. For the convenience of our readers, however, they are entered in a book, and may be seen on application at the office of "The Builder," 2, York-street, Covent Garden.]

For the several works required for the enlargement and rebuilding of St. Ann's Chapel, Bishop Auckland; and also for building a new market cross there.

For the supply of Radford with gas, also with lamps, lamp-irons, pillars, and other apparatus for fixing the same.

For the erection of a chapel in Edward-street, Parade, Birmingham.

For the execution of the whole of the works of the Cumnock extension of the Glasgow, Paisley, Kilmarnock, and Ayr Railway, in three contracts.

For the works of the alterations and improvements of the Dalkeith Railway, and its junction with the North British (extension of time).

For the erection of additional works to the Union Workhouse at Midleton (Ireland).

For the rebuilding of the church of Ballymony, county of Cork.

For the erection of gas-works at Downpatrick, including the building of a retort-house, the supplying and fitting up of the gasometer, tank, retorts, ovens, purifiers, hydraulic mains, &c.

For the erection of the Ashbourne workhouse (further extension of time).

For the supply of curb-stone, edging, paving, and penanting, the best Haytham stone, or Frenchay, or Welsh, or other stone of equal quality, and for the setting or laying the same in the footpaths of certain streets, &c., of Bristol, for three years, from 29th September.

For the execution of the earth-work for a drain or culvert through Canon's Marsh, Bristol.

For the separate branches of work connected with the erection of the proposed congregational schools at Salisbury-street and William Henry-street, Liverpool.

For the restoration and pewing of Blaby Church.

For the erection of a new roof to St. Margaret's Church, Wereham, Norfolk.

For the execution of Contract No. 2 on the Lynn and Ely Railway line, commencing at the termination of No. 1 in the parish of Denver, Norfolk, and terminating at the junction with the Eastern Counties line, near Ely, a length of about 12¼ miles, comprising the usual works of excavation, embankment, bridges, culverts, stations, &c.

For certain alterations and additions to the infirmary of the Windsor Union Workhouse.

For repairing and externally painting the churches of Ardmore, Dungarvon, Kilrosanty, and Monksland, in the county of Waterford, Ireland: and for painting the exterior of the churches of Affane, Killea, Kinsalbeg, St. Olave, St. Patrick, Ringagonah, Rossmere, and Templemichael in the same quarter.

For swords and scabbards for the East India Company.

For the erection of a Presbyterian Church in Wolverhampton-street, Birmingham.

For the supply of flints and Kentish ragstone for the Greenwich and Woolwich turnpike lower road, for one year, from July 1 and further, until determined by three months' notice on either side.

For the rebuilding of Sandbach Church steeple, &c.

For the erection of a new barn and straw-house at Waterditch Farm, in the parish of Christchurch.

For a supply of from 4000 to 5000 cubic yards of broken Guernsey granite, or other hard stone, for the repair of the roads of Regent-street, Whitehall, &c.; and of from 2,000 to 2,500 yards of same material for the repair of the Albany-road and other roads in the Regent's Park.

For a supply of regimental buttons for the East India Company.

For the erection of an infirmary and receiving wards at the Rye Union Workhouse.

For the erection of two chapels at the Tower Hamlets' Cemetery.

For a supply of 1,000 tons of new blue Guernsey granite, broken to a 2½ inch gauge ring, to be delivered at the water side, Chelsea, for the Improvement Commissioners.

For the erection of a Corn Exchange and Market at Ely.

For the Iron furnishings of the Gas Works at Dollar, N.B.

For the construction of a Timber Landing Staith, at the Ferry-boat dock at Hull, and other works connected therewith, and for removing the old break-water Jetty there.

For the erection of two Chapels in the Cemetery of Coventry.

For any required quantity of hard core, pit ballast, broken flints, &c., for three years from 20th June, for the Commissioners for paving, lighting, and improving the hamlet of Kentish-town and its vicinity; the quantities required not to be less in one year than 2,500 yards of hard core, 1,500 yards of pit ballast, and 500 yards of broken flints.

For supplying to the same Commissioners, laying down and bedding in proper morter for three years, from 20th June, any required quantity of Aberdeen kerb 12 inches by 8 inches; of York paving 2½ inches thick; and of dressed and undressed granite crossings; the quantities not to be less in any one year than 2,000 running feet of kerb; 14,000 feet (super) of paving; and 100 yards of crossings.

APPROACHING SALES OF WOOD, &c.
BY AUCTION.

At Southampton: the erections of the Infant School, also of a stable, gig-house, and shed.

At Sawley, county of Derby: nine lots of fine cut oak, ash, and elm—7,500 feet in all.

At Bristol: 3,000 to 4,000 feet of first rate rosewood and Spanish mahogany veneers, also Spanish curls.

At Bristol: a quantity of prime well-seasoned mahogany, and cedar boards and planks, and a few logs of Honduras and Spanish mahogany, &c.

At Ashwelthorpe, near Norwich: 40 oak and 90 ash trees of large dimensions.

At Newton, Blossomville, Bucks: 1,000 feet oak, 40 ash and elm trees, a quantity of hard wood, &c.

At Poole: a stock of timber, deals, laths, slate, &c.

At Southery, Norfolk: about 150 very fine beech trees, 12 to 18 inches girth; 1,000 feet ½ board; 1,000 feet, 8 inch by 2, scantling; a lot of slabs, top wood, hurdles, &c.

At Sudbrook, Gloucestershire: the whole of the apparatus and machinery connected with the preparation of timber on the anti-dry-rot principle.

At Charity Farm, Great Bardfield, Essex: 90 good oak timber trees.

At Elmstead, near Colchester: 670 oak and birch mounds, 15 loads of poles, 2,700 bavins, 132 bundles, birch, &c.

At Beaumont, near Thorpe, Essex: 300 lots of very choice and well-seasoned timber, deals and battens, floor boards, &c.; and a quantity of ironmongery, comprising locks, screws, latches, pullies, nails, &c.; and a lot of shutters, deals, sash-frames and sashes, new panelled doors, window-frames, oak gates, stone pavement, cement, glue, pitch, &c.; with 9 oak and 4 elm trees.

At Weeley, Essex: 400 small oak trees, 7,000 bavins, a lot of oak seconds, poles, &c.

At Curraghmore, Ireland: 300 lots of prime grose oak, spruce, larch, and Scots fir.

At Green-street, Deritend, near Birmingham: an extensive iron foundry.

At Tardebegg, Worcestershire: an almost inexhaustible mine of clay; also a brick-yard, with kilns, flues, &c.

At Marlborough: a choice stock of marble chimney-pieces.

At Chelmsford: 102 oak and 10 ash timber trees, in lots.

At Wilton, Wilts: a whole stock in trade, comprising, besides oak, ash, elm, and pine timber; every article necessary to builders, smiths, carpenters, &c.

TO CORRESPONDENTS.

"*Amateur Turner.*"—Workshops may not be of wood. Notice must be given to the surveyor.

"*G. Armitage.*"—Number for 14th March, is out of print. First number for present year contains index to Vol. III.

"*W. X.*"—Laxton's or Skyrings. Through any bookseller.

"*D. J. J.*"—We will inquire.

"*B. P. W.*"—Next week.

"*E. P.*"—Kennett, York-street, Covent-garden.

Received.—"W. B." (Oundle), "C. F.," "G. W. B.," "Veritas," "B. H."

Books received.—"Family Herald," part 37. (Biggs, Strand). "Musical Herald," part 1. (Biggs). "Dolman's Magazine" for July. "Old England's Worthies," part 2. (C. Knight). "Pictorial Gallery of Arts," part 7 (Architecture continued). C. Knight.

ADVERTISEMENTS.

TO BUILDERS AND CARPENTERS.

A Considerable saving will be effected in the purchase of IRONMONGERY, by applying at F. R. WILLIAMSON'S Wholesale Warehouse, No. 35, Chiswell-street, Finsbury-square, near Whitbread's Brewery

Best Patent Cut Clasp.

3d. 4d. 6d. 10d. 20d.
5d. 7d. 8d. 1s. 6d. 2s. per 1000.

Best Sheet Cut Floor Brads 16s. per cwt.
Best Town Glue 40s. per cwt. Do. Scotch 52s. per cwt.

Best Patent Sash Line.

1 2 3 4 5 6
4s. 3d. 5s. 6s. 6d. 7s. 6d. 10s. 12s. per gross.

Elliptic Stoves, 2d. per inch. Registers, 6d., 7d., 8d. per inch.
Self-acting Kitchen Ranges with Oven and Back Boiler.
Wrought Bars and Bright Fittings.

3 ft., 3l. 3s. 3 ft. 6 in., 3l. 12s. 6d. 4 ft., 4l.

Lists of Prices had on application at the Warehouse; if by letter prepaid, inclosing postage stamp.

TO ARCHITECTS, BUILDERS, &c.

R. HENLY & Co., WHOLESALE IRONMONGERS, and MANUFACTURERS of KITCHEN-RANGES, STOVES, &c., 196, Blackfriars-road, and 117, Union-street, Borough.

Strong Self-acting Kitchen-Ranges, with back Boiler and Oven, and Wrought Bars:—

3 ft. 3 ft. 3 in. 3 ft. 6 in. 3 ft. 9 in. 4 ft.
3l. 6s. 3l. 13s. 3l. 16s. 4l. 4l. 10s.

Henly's Patent Improved, with back Boiler and Wrought Iron Oven:—

3 ft. 3 ft. 3 in. 3 ft. 6 in. 3 ft. 9 in. 4 ft.
5l. 5l. 15s. 6l. 5s. 6l. 10s. 7l.

Best Register Stoves, at 7d., 8d., and 9d. per inch.
Do. Elliptic do., at 3½d., and 4d. do.

Manufacturer of WOLFASTON'S PATENT REGISTER STOVES, a certain cure for SMOKY CHIMNEYS, and effecting a great saving in fuel. To be seen in use daily.

Orders from the Country, accompanied with a remittance or reference, will meet with prompt attention.

FIRE BRICKS.

W. WARD, Honduras Wharf, Bank-side, and St. Michael's-alley, Cornhill, has just landed a large quantity of his very superior manufactured Fire Bricks, of Stourbridge, Welsh, and Newcastle. Prices very low. Shipments made for the East and West Indies, &c., with the greatest promptness. Gas companies, engineers, builders, and all large consumers supplied from ships in the river at a much lower price. A very large stock on hand of Bricks, Lumps, Tiles, and Clays.

River sand and gravel by freight to any wharf and dock.

BEST PAN WATER-CLOSETS, with Round Valve, complete, 28s. each.
WASHING COPPERS, above 12lb., 1s. 1d. per lb.
COCKS, Bib, Ball, and Stop, ½-in. 1s. 8d., ¾-in. 2s. 4d.
Lifting Force Pumps, 2½-in., 4l. 4s., and every description of Copper and Brass Work equally low, at Messrs. MACGLASHAN & CO., 16, Long Acre, London.

HAND-IN-HAND BUILDING ASSOCIATION, ON ENTIRELY NEW PRINCIPLES.

A PUBLIC MEETING will be held on WEDNESDAY Evening next, at Eight o'clock precisely, at the Western Literary Institution, Leicester-square, to explain the principles on which the association is established. T. E. DRINKWATER BETHUNE, Esq., in the chair. Entrance in Princes-street.

Railway Surveying, Levelling, Plotting, Computing, use of Theodolite, &c., PRACTICALLY TAUGHT.

THE Advertiser (an Engineering Surveyor of Extensive Practice), is now devoting his time to the instruction of persons for Railway Surveyors, &c., &c., undertaking to make them SELF EVIDENTLY COMPETENT to Survey, Level, Plot, Compute, Determine Heights and Distances, give Curves and Gradients, &c., &c., on all sorts of Ground. Terms Five Guineas; proficiency guaranteed and references given.—Apply, if personally between 5 and 10 P.M., to G. T., 117, Park-street, Camden-town.—N.B. The above imparted in as short a period as possible consistent with a thorough instruction.

PORTLAND CEMENT does not vegetate in damp situations, requires no colouring, is perfectly hydraulic, and resists the action of frost. The price is now considerably reduced, and the public are thereby enabled to avail themselves of these distinct advantages.

Manufactured by J. B. WHITE and SONS, of Millbank-street, Westminster; and sold at their warehouses—Earl-street, Blackfriars; Druce's Wharf, Chelsea; Bell's Wharf, Paddington; and Albion Wharf, Deptford-bridge; at Seel-street, Liverpool; and Salmon and Co.'s, Dublin.

ROMAN CEMENT, &c.
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Orders addressed to either place for ROMAN CEMENT of genuine quality will be executed with promptitude and the strictest regard to quality and economy.

KEENE'S PATENT MARBLE CEMENT.

WITHOUT noticing CAUTIONS, which are as absurd as they are uncalled for, or disproving assertions, which carry with them their own refutation, the patentees of KEENE'S CEMENT venture to believe, that this material will very advantageously stand the test of comparison with any cement of a similar nature, however INVALUABLE, now before the public. They derive this opinion from its all but exclusive use in the new buildings north of Hyde-park, on the Brompton estate, and in many other public and private edifices, both in London and the country. Amongst others may be mentioned the works recently executed at the Colosseum, Regent's-park, where its hardness and beauty of appearance have caused it to be extensively used for skirting and other mouldings, in place of wood, for columns instead of marble, and as a substitute for stone in paving the floors of the corridors and conservatories.

Patentees and manufacturers, J. B. WHITE & SONS, Millbank-street, Westminster,

MARTIN'S FIRE-PROOF AND ORNAMENTAL CEMENT.

CAUTION.—Messrs. STEVENS and SON, Patentees, beg to caution their friends and the trade generally against confounding this invaluable Cement with others, erroneously said to be of the same description. S. and S. pledge themselves, that MARTIN'S CEMENT is totally dissimilar in composition and manufacture from every other, and, being a neutral compound, is not only free from chemical agency upon any substance with which it may come in contact, but completely resists the action of the strongest acids. They feel it a duty to direct attention to the following properties, which it exclusively possesses:—

1. It rapidly acquires the hardness of stone.
2. Unlike other internal cements, its hardness is uniform throughout its entire thickness.
3. Its surface (which may be made equal to that of the finest marble) NEVER THROWS OUT ANY SALT, and will receive paint in four days, without peeling, when put upon dry work.

It is peculiarly adapted as an internal stucco for walls, skirtings, architraves, mouldings, and enrichments of all kinds, to all of which purposes it has been extensively applied by Mr. Thomas Cubitt on the Grosvenor estate, &c.

For the above purposes, it possesses great advantages over wood, being more economical and durable, resisting fire, damp, and vermin.

For the floors of hall and fire-proof warehouses, its lightness, durability, and uniform surface give it an immense advantage over stone, being, at the same time, much more economical. The most satisfactory references can be given. To be had of the Patentees, Plaster of Paris and Cement Manufacturers, 186, DRURY LANE.

Agent for Liverpool and Manchester, Mr. R. PART, 28, Canning-place, Liverpool.

TO ARCHITECTS, ENGINEERS, CONTRACTORS, BUILDERS, MASONS, AND PLASTERERS, MERCHANTS, SHIPPERS, AND THE PUBLIC IN GENERAL.

JOHNS and CO.'S PATENT STUCCO CEMENT.—The following are the positive advantages possessed by this Invention over every Cement hitherto introduced:—It will effectually resist Damp. It will never vegetate nor turn green, nor otherwise discolour. It will never crack, blister, nor peel off. It will form a complete Stone casing to any Building covered with it. It so closely resembles Stone that it is impossible to detect it. It never requires either to be painted or coloured. It will keep fresh and good in the cask in any Climate for any number of years. It is the only Cement that can be depended upon for export. It is the only Cement that can be used with confidence by the Sea-side. It may be used in the hottest or coldest Climates at any season. It will adhere to any substance, even to Wood, Iron, or Glass. It will carry a larger Proportion of Sand than any other Cement. It matures by age, and becomes perfect when other Cements begin to perish. It may be worked through the Winter, as frost has no effect upon it. It may be used on the Inner Walls of new Houses, which may be papered over or painted directly. Roofs laid or pointed with this Cement will remain undamaged by the severest Storms. Any Plasterer may apply it, the Instructions for use being very clear and distinct. The first cost of this material does not exceed that of the cheapest Cement now in use; but with all the above-named extraordinary and valuable advantages, nothing can approach it in point of economy.

Architects and Builders who have used this Cement have declared that it requires only to be known, to be universally preferred.

Specimen may be seen, and a Prospectus fully describing the Cement and its mode of application, together with a volume of Testimonials from every part of the Kingdom, may be obtained on application at the office of "The Builder," and of MANN and CO., SOLE AGENTS for the Patentees, 5, Maiden-lane, Queen-street, Cheapside, London: of whom also may be had,

JOHNS and CO.'S PATENT STONE-COLOUR STUCCO PAINT, expressly intended for Painting over exterior Walls of Houses that have been covered with Roman or other Cements, and which have become dirty and discoloured. It is in every way better suited for this purpose than White Lead Paint, which will frequently come off in flakes, being in direct chemical opposition with Cement; whereas MESSRS. JOHNS and CO.'S PATENT PAINT having an affinity for Stucco, binds itself with it, stopping the suction, thereby rendering the wall proof against weather, and in the finish producing a pure stone-like effect, producible by no other Paint whatever. It is cheap in its application,—and may be used by any Painter, in any climate, even in the most exposed Marine situations.

FINE ARTS.

By Her Majesty's Royal Letters Patent.

LORIMIER'S TRANSPARENT PLANES for Perspective Drawing; BENJAMIN WEST, Patentee.

"This Instrument will enable Artists and others to make any Drawing, whether from Nature or Models, in perfectly true perspective, so that a likeness or landscape may be taken in a few minutes absolutely perfect. It is used by her Majesty's Royal Sappers and Miners, Chatham. To Travellers it would be found serviceable, since it can be employed without the knowledge of drawing."—*Art Union.*

Price 18s. and 26s. Apply for Agents to BENJAMIN WEST, 2, St. James's-walk, Clerkenwell.—Sold by BARRITT and Co., 173, Fleet-street, London; GRIFFIN and Co., Glasgow, and by all Fancy Stationers, &c.

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TIMBER of any Size, PLANK, DEALS, and BATTENS, &c. Sawn on the most approved principle. Boards, &c., Prepared, Matched, and Grooved, by Muir's Patent Machinery. The Mills have all the advantages of navigation and water-carriage, being connected with the Thames by the Grosvenor-canal. Goods fetched from the docks and carted home free of charge.

Address to HENRY SOUTHAM,
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N.B. Estimates given for Sawing and Planing.

THE GENERAL WOOD CUTTING COMPANY, TIMBER and DEAL SAWING and PLANING MILLS, Belvedere-road, Lambeth, near Waterloo-bridge.—SAWING in all its branches executed with the greatest precision and despatch. PLANING by the most approved Machinery, reducing the Boards to a parallel width and thickness, and grooving or matching with undeviating accuracy. The operation economises time, money, and material.

SIR WILLIAM BURNETT'S PATENT for the Preservation of Timber, Canvas, Cordage, Cotton, Woollen, &c., from Decay.

TESTIMONIALS.

From THOMAS GRAHAM, Esq., M.A., F.R.S., L. and E., Professor of Chemistry, University College, London.

"After making several experiments on wood prepared by the solution of chloride of zinc for the purpose of preservation, and given the subject my best consideration, I have come to the following conclusions.

"The wood appears to be fully and deeply penetrated by the metallic salt; I have found it in the centre of a large prepared paving block.

"The salt, although very soluble, does not leave the wood easily when exposed to the weather, or buried in dry or damp earth. It does not come to the surface of the wood by efflorescence, like the crystallizable salts. I have no doubt, indeed, that the greater part of the salts will remain in the wood for years, when employed for railway sleepers or such purposes. This may be of material consequence when the wood is exposed to the attacks of insects, such as the white ant in India, which I believe would be repelled by the poisonous metallic salt.

"After being long macerated in cold water, or even boiled in water, thin chips of the prepared wood retain a sensible quantity of the oxide of zinc; which I confirmed by Mr. Toplis's test, and observing that the wood can be permanently dyed from being charged with a metallic mordant.

"I have no doubt, from repeated observations made during several years, of the valuable preservative qualities of the solution of chloride of zinc, as applied in Sir. W. Burnett's process; and would refer its beneficial action chiefly to the small quantity of the metallic salt which is permanently retained by the ligneous fibre in all circumstances of exposure. The oxide of zinc appears to alter and harden the FIBRE of wood, and destroy the solubility, and prevent the tendency to decomposition of the azotized principles it contains, by entering into chemical combination with them.

(Signed) "THOMAS GRAHAM."

"University College, 25th October, 1845.

From Professors BRANDE and COOPER.

"London, 4th November, 1845.

"SIR,—We have this day again examined the specimens of canvas and wood prepared according to the specification of your patent, and which, in the month of April, 1844, we placed in a damp cellar, where they have remained up to this date.

"We are now enabled satisfactorily to corroborate the favourable opinion expressed in our former report. The canvas remains amply protected from all fungous vegetation and rottenness, while a corresponding sample of the same piece, which had not been prepared by immersion in the solution of chloride of zinc, is entirely decayed, being mouldy, rotten, black, and in places resembles timber.

"We have also lately compared the strength of a fibre of a piece of canvas which we prepared according to your specification, in October, 1844, with that of the fibre of the same canvas, unprepared, and find that it has in that respect sustained no injury. We are therefore of opinion that your process will not, after any lapse of time, tend to deteriorate the strength of the fibres of the substances in question.

"In regard to the several samples of different species of wood above adverted to, each of which was cut into two, one half being imbued according to the directions of your specification with the dilute solution of chloride of zinc, while the other half was left in its original condition, we have also to make a favourable report, and to repeat our opinion of the efficacy of your process as a preventive of dry rot, and similar sources of decay; the unprepared specimens are manifesting symptoms of decay and mildew, while those which have been protected by your preparation are clean and sound.—(Signed) "WILLIAM THOMAS BRANDE,
"JOHN THOMAS COOPER."

"To Sir William Burnett, K.C.H., F.R.S., &c. &c."

Testimonials from numerous other parties may be obtained on application, personally or by letter, to the Secretary, and Specimens may be seen at the Office, 55, King William-street, London-bridge.

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*** For the Numerical Explanation of DREDGE'S PRINCIPLE, see the "Mechanics' Magazine," No. 1172.

THIS system removes from the Arch to the horizonal line the horizontal force of the whole Bridge, which makes the roadway as powerful as the arch itself, and the arch, with half the material, more than double its original power. The pressure on the key-stone of the arch is the horizontal force of a Bridge, which acts directly on that point as a dead load of self-destruction; and it has thrown down, within the last eighteen months, nearly sixty arches of Viaducts and Bridges.

EXAMPLE:—The Menai Bridge, whose depth is 1-14th of its length, and the suspended weight 800 tons, its horizontal force is 2,800 tons of self-destruction on the centre; hence it would require but a small portion of the material and cost of that bridge to construct one over the Menai Straits on this plan, that would possess far greater power and stability than the present structure.

This principle has been fully tested nearly ten years, by the construction of fifteen public bridges for the Government and others in Great Britain. It is also established in India.

Bath, 3rd April, 1846.